Rainbow™ 100

CP/M®– 86/80 User's Guide

digital

AA–Y524A–TV

Rainbow™

CP/M®– 86/80 User's Guide

digital equipment corporation

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Preface

Welcome to the Rainbow Computer

We congratulate you on the purchase of the Rainbow personal computing system. The Rainbow computer is today's most versatile CP/M system. And it is the only industry standard computer built to DIGITALs quality specifications and backed by DIGITALs commitment to service and support. The Rainbow computer is a sound investment in personal productivity that you'll enjoy using every day.

To get started, we have prepared a set of easy-to-use documentation. In the back of these volumes is a card to encourage your comments. Please let us hear from you.

Remember that purchasing your first Rainbow computer is just the beginning of your relationship with Digital Equipment Corporation, the world's leading manufacturer of minicomputers. Our dedication to quality manufacturing, our extensive availability of spares and accessories, and our service organization of 16,000 representatives worldwide are your further assurance of total DIGITAL quality. With the Rainbow computer and our unique CP/M-86/80 operating system you have an investment that will grow in value as you use it now and in the future.

Intended Reader

This guide is intended for first-time users of Digital Equipment Corporation's Rainbow computer. The purpose of this guide is to provide you with detailed information on how the Rainbow computer operates.

The Rainbow computer runs the CP/M-86/80 operating system, an operating system developed especially for it. Although other operating systems can be run on the Rainbow computer, the CP/M-86/80 operating system is used in the examples in this guide.

This guide assumes that you have:

- Installed the Rainbow computer according to the instructions in the *Rainbow Installation Guide.*
- Read the *Rainbow CP/M-86/80 Getting Started,* which includes:
  - Starting and stopping the computer
  - Making a copy of the CP/M-86/80 master system diskette
  - Taking the self-paced Rainbow computer instruction course (LEARN RAINBOW)

Guide Organization

Chapter 1	introduces the CP/M-86/80 operating system and includes an example of how to create and print a short document.
Chapter 2	discusses the CP/M-86/80 operating system commands in alphabetical order.
Chapter 3	describes how to create and edit documents using the CP/M-86/80 editor called RED.
Chapter 4	discusses how to create a system/application diskette.
Chapter 5	discusses the basic procedure for copying files to and from the hard disks.
Chapter 6	discusses advanced hard disk procedures.
Appendix A	describes how to store, handle, and use diskettes.
Appendix B	lists the operating system messages, what they mean, and what to do about them.
Appendix C	lists the DIGITAL Customer Help Line phone numbers.

Conventions Used

Follow the conventions listed below while using this guide.

- In examples of dialog between you and the computer, what the computer displays on the screen is shown in black. The characters you type from the keyboard are shown in color.
- You can type these characters in either lowercase or uppercase characters. Use the Shift or Lock key (see Figure 1) on the keyboard to enable uppercase characters.

> **IMPORTANT**
> The Lock key does not enable you to type the numeric and special symbol keys. For example, if you want to type $, %, *, (, :, ? you must use the Shift key. The Lock key only affects the alphabetic characters.

- Make sure to type all spaces and punctuation marks exactly as they are printed.
- When you see (Return), press the Return key on the keyboard (see Figure 1).
- When you see (Ctrl/C), hold down the control key (Ctrl key on the keyboard as shown in Figure 1). While you are still holding the Ctrl key, press the C key and then release both keys.

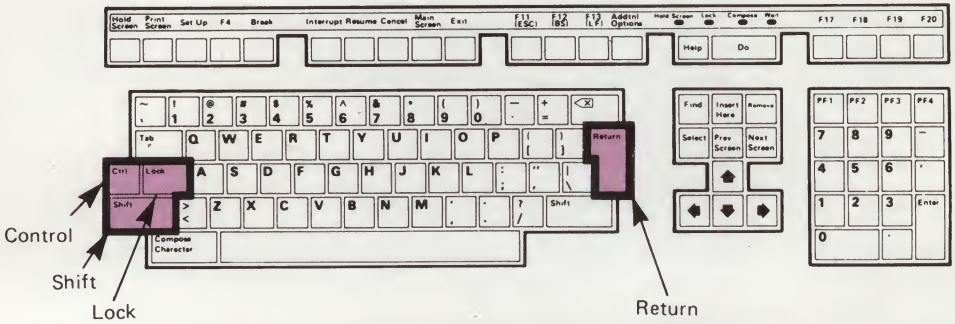


Figure 1. Control, Shift, Lock, and Return Keys

Information for Advanced CP/M-86/80 Users

Advanced users of the CP/M-86/80 operating system can find the Rainbow CP/M-86/80 Technical Documentation Kit useful (order number QV070-GZ). You can also order the information in this kit separately as follows:

1. CP/M-86/80 information and the industrial standard specifications for the Rainbow computer (order number QV067-GZ)
2. Information on DIGITAL's family of printers for the Rainbow computer (order number QV069-GZ)

Turn to the end of this guide for ordering information.

1

Introducing CP/M-86/80

An operating system is a group of instructions that manages the overall operation of the computer, and the way you interact with the computer. One of the operating systems used on the Rainbow computer is called CP/M-86/80.

With this operating system, you can run a variety of programs to help you write memos and reports, do financial analyses, and many other functions easily and efficiently. These programs include SELECT-86, Multiplan-86, or MBASIC-86.

Hands On Experience

This chapter explains introductory operating system concepts and operations that allow you to:

1. Start the operating system
2. Use a few common commands (instructions to the operating system) and keys
3. Create a short memo

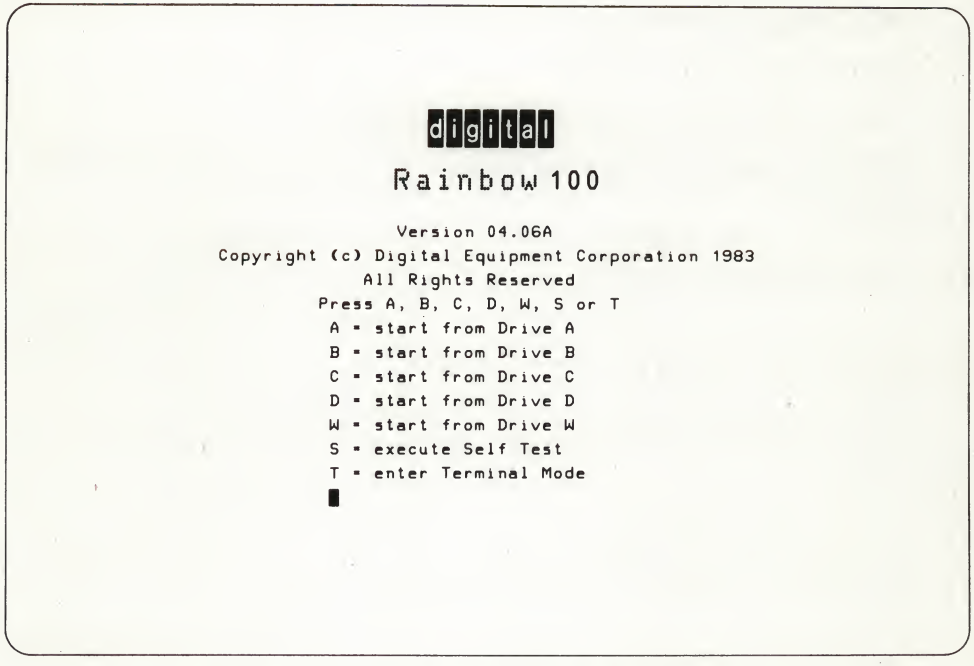
4. Make changes to the memo
5. Print the memo on a printer
6. Make a copy of the memo on another diskette
7. Look at, rename, or erase the memo
8. Get help

The end of this chapter includes information on correcting problems.

Starting the Operating System

Start the CP/M-86/80 operating system by completing the following instructions:

1. Be sure there is no protective card or diskette in any of the drives.
2. Turn on the computer by pressing the power switch to the 1 (on) position on the front of the system unit. The drive doors can be open or closed.
3. Be sure the Main System Menu is displayed on the screen, as shown in Screen 1.



Screen 1. Rainbow Main System Menu

IMPORTANT
Do not press any keys until the Main System Menu is displayed. If you accidentally press a key and the Main System Menu is not displayed, reset the computer by pressing the Set-Up key, and then the Ctrl/Set-Up keys.

4. Remove the CP/M-86/80 working diskette from its protective paper envelope. (You created this diskette in the *Rainbow CP/M-86/80 Getting Started.*)
5. Open the drive A door and insert the working diskette. Be sure to align the orange arrow on the diskette with the orange stripe on the diskette drive.
6. Close the drive door.

7. Start the CP/M-86/80 operating system by typing:

```
A
```

in response to the Main System Menu. Typing A tells the computer which drive contains the operating system diskette.

After you hear clicking and whirring sounds, the CP/M-86/80 operating system displays:

```
CP/M-86/80 Loading...
```

followed by the start-up message shown in Screen 2.

```
     CP/M-86/80 Version 2.00(1.1)
(c) Copyright 1981 Digital Research Inc.
(c) Copyright 1982,1983 Digital Equipment Corporation



A>
```

Screen 2. CP/M-86/80 Start-up Message

NOTE
The screens in this guide may not be identical to those displayed on your computer. The general information should be the same, but specific information, such as dates, times, and Version numbers may differ. If at any time, a screen does not display at all, refer to the messages in Appendix B of this guide for help.

The last symbol displayed on the left side of the screen, A>, is called the operating system prompt, or prompt. It indicates that the operating system is waiting (or prompting) for instructions. The prompt consists of the drive the operating system is currently working from and a right angle bracket (for example, A>). This drive is known as the active drive, or default drive.

Using Commands and Keys

Whenever the prompt is displayed, you can type a command. Commands are instructions that you type from the keyboard. These instructions tell the operating system what to do.

Most of the operating system commands are designed to act on a file, which is a collection of information stored on the diskette. The CP/M-86/80 operating system deals with two types of files:

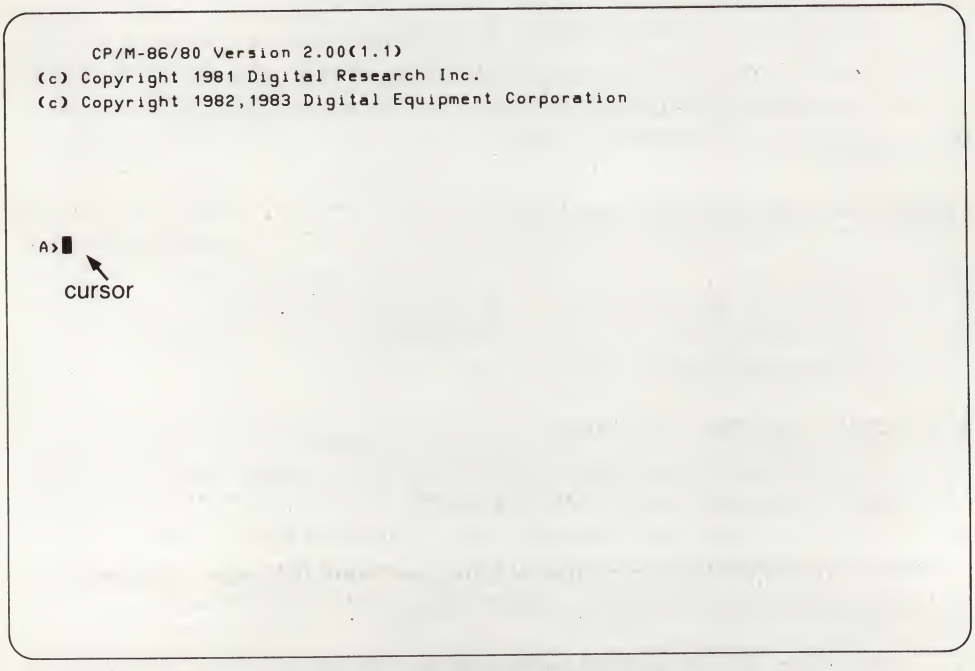
- Program files, which contain a collection of instructions telling the computer how to perform a specific task.
- Text files, which contain a collection of user information, such as a list of numbers or a memo.

The operating system accepts commands from you to:

- List the names of files stored on a diskette
- Copy the entire contents of a diskette to another diskette
- Copy individual files
- Create text files
- Display a text file on the screen

- Print files on a printer
- Delete files
- Run programs

You type a command directly after the prompt, A>. As you type a command, the computer displays the characters on the screen to the left of the cursor, which is shown in Screen 3.



Screen 3. Rainbow Cursor

The cursor is a blinking rectangle (or a blinking underline if you change it using Set-Up) that indicates where the next character you type is displayed. The cursor moves to the right each time you type a character.

NOTE

The computer displays the characters you type as lowercase characters unless you use the Shift or Lock keys to obtain uppercase characters. The Lock key affects only alphabetic characters. It does not allow such characters as :, (, ?. (To produce these characters, press the Shift key.) However, you can change this feature using the Set-Up key. Refer to the Rainbow Owner's Manual to learn how to change features in Set-Up. A light above the Help and Do keys indicates when the Lock key is on. To release the Lock key, press the key again.

You can type commands in either uppercase or lowercase characters. After typing most commands, press the Return key. Pressing the Return key tells the operating system that you have finished typing the command and want the command executed. Some programs display messages such as <CR> (for carriage return) or "RETURN" to indicate that you should press the Return key.

Listing the Names of Files

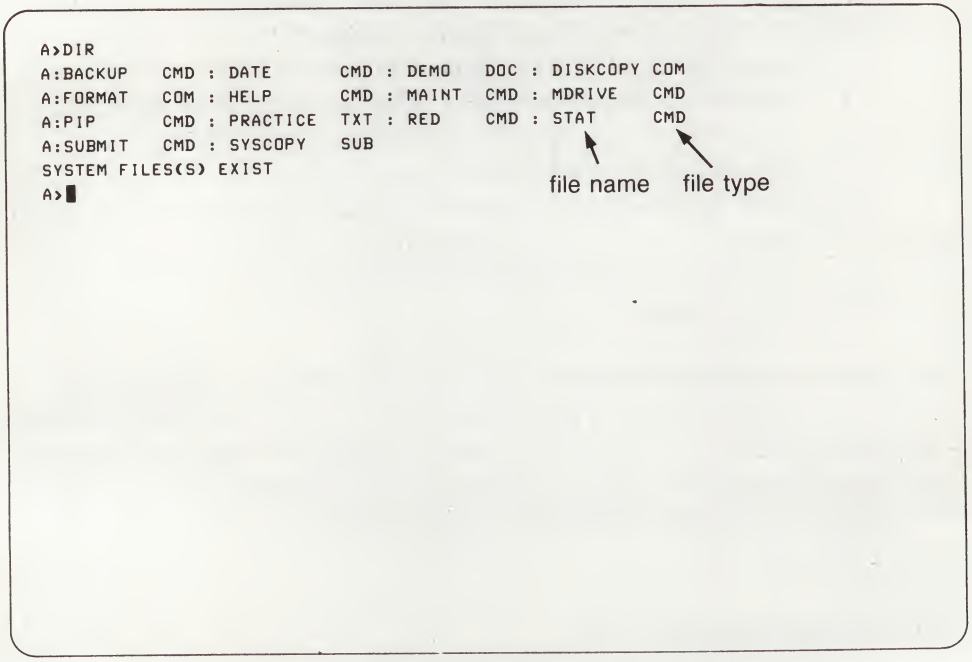
One common command is the DIR command, which displays the list of file names that are stored on a diskette. The list of file names is called the diskette's file directory. Each diskette that contains files also contains a file directory, or directory, which is similar to a book's table of contents.

To list the files already stored on the working diskette in drive A, after the prompt, type:

A>DIR Return

Type only what is printed in color. Remember that the symbol Return means "press the Return key".

The operating system displays a list of file names. Screen 4 shows the entire dialog.



Screen 4. DIR Command for Drive A

NOTE

Complete file names consist of two parts: a file name and a file type. In the directory, the file name and file type are separated by a space. The file type indicates the type of file. For example, the file type DOC indicates a document or text file. The file names on each line in the directory are separated from each other by a colon (:). Refer to Chapter 2 for more information on file names.

The operating system displays the message `SYSTEM FILE(S) EXIST` to remind you that other files are stored on the diskette in the system directory. Chapter 2 describes the system directory.

Mistyping and Correcting a Command

The operating system executes commands after you press the Return key. If you misspell a command and then press the Return key, the operating system indicates it does not understand the command by redisplaying the incorrect command followed by a question mark (?). Try the following example. Remember, in the examples in this guide, you should only type the characters that are printed in color. What the computer displays is printed in black.

Type:

```
A>DIRR Return
```

The operating system displays:

```
DIRR?
A>
```

The prompt is displayed to show that the operating system is waiting for you to retype the command correctly (see Screen 5).

```
     CP/M-86/80 Version 2.00(1.1)
(c) Copyright 1981 Digital Research Inc.
(c) Copyright 1982,1983 Digital Equipment Corporation



A>DIRR
DIRR?


A>
```

Screen 5. Misspelling a Command

If you mistype a command and realize you have made a mistake before you press the Return key, there are several ways to correct it. Figure 2 shows one of the keys that you can use to correct typing errors.

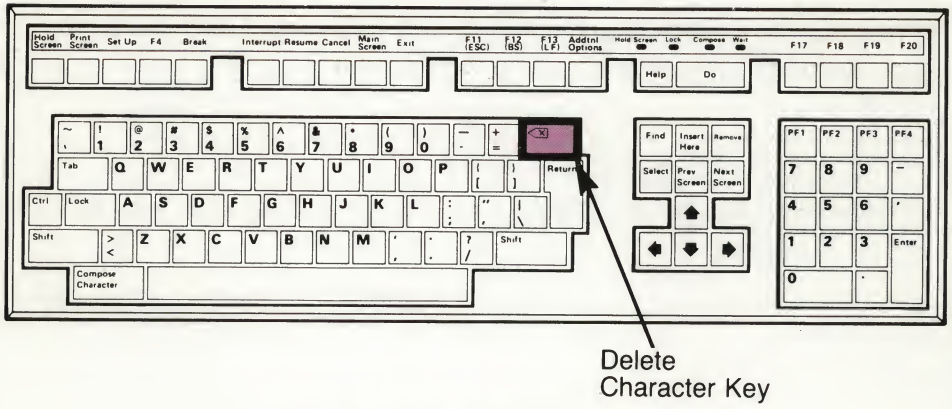


Figure 2. Delete Character Key

Delete Character Key. Each time you press the delete character key, shown in Figure 2, the last character you typed is erased from the screen and the cursor is moved back one space. (You cannot erase the prompt.)

1. To see how the delete character key works, type:

   ```
   A>RAINBWO
   ```

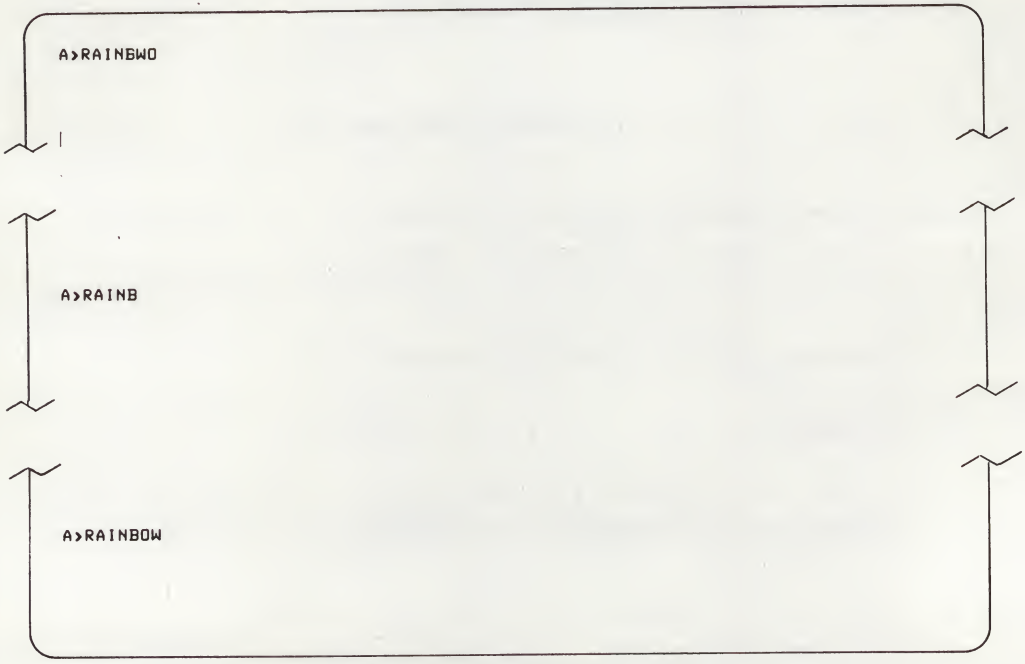
2. Press the delete character key twice. The characters "O" and "W" disappear leaving the characters `RAINB` displayed on the screen.

3. Now type:

   ```
   OW
   ```

   to complete the word "RAINBOW".

   The operating system displays `RAINBOW` on the screen. Screen 6 shows this sequence.



Screen 6. Using the Delete Character Key

4. Press the delete character key seven times to erase the entire word.

Creating and Printing a Memo

The following example shows you how to use the program called RED to create a memo and store it on the diskette. The example also shows you how to print the memo on a printer.

Starting the Editor

An editor is a program that allows you to create and change any text file. The editor you use with the CP/M-86/80 operating system is called RED.

The first step in creating a file is to name it. Then type the text.

1. To start RED and name the file, type:

```
A>RED MEMO.TXT (Return)
```

> **NOTE**
> The file name can be no longer than eight characters. The file type can be no longer than three characters. You can use both alphabetic and numeric characters.

RED responds with:

```
Loading RAINBOW EDITOR Version 1.1
```

to show that the editor is creating the file name.

After the file name is created, RED displays, at the top of the screen, a one-line list of commands you can use with the editor. On a second line, RED displays the name of the drive the file will be stored on, followed by the file name. (See screen 7).

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
 Document: A:MEMO.TXT                        Char:   1 Line:   1

L-------------------------------------------------------------------------------R
```

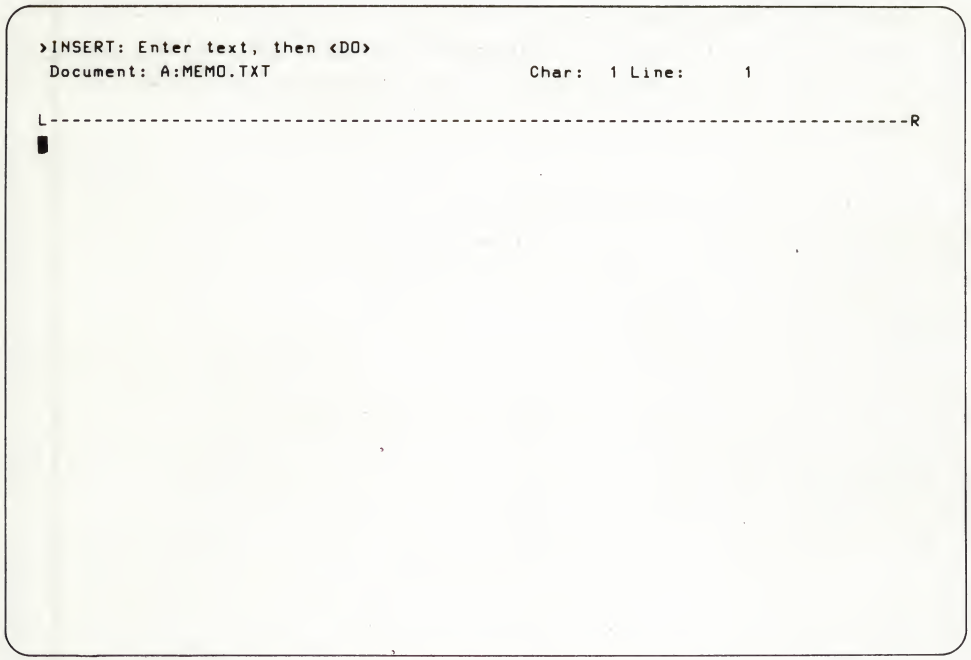
Screen 7. Creating a File Name Using RED

2. To insert text in the memo, use the first command listed in the top line (Insert). Type:

   I

   NOTE
   When using a RED command, type only the first letter of the command.

   The top line of the screen changes and RED instructs you to enter the text and press the Do key when finished. (See Screen 8).



Screen 8. The Insert Command

For this example, enter the following text shown in color. Be sure to press the Return and Do keys where indicated.

TO: All Company Employees (Return)
FROM: A. Marshall, Manager (Return)
SUBJECT: Extra Desk Keys (Return) (Return) (Return)
All desks now have spare keys. If you have lost your key (Return)
or would like an extra one, please report to the guard's (Return)
office in the front lobby. (Return) (Return)
Thank you (Return) (Do)

Pressing the Do key tells RED that you have finished entering text for this file. The top line of the screen returns to the original line and the cursor is displayed below the last line of text that you entered. (See Screen 9).

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
 Document: A:MEMO.TXT                    Char:  1 Line:    11

L-------------------------------------------------------------------------R
TO: All Company Employees<
FROM:  A. Marshall, Manager<
SUBJECT:  Extra Desk Keys<
<
<
all desks now have spare keys.  If you have lost your key<
or would like an extra one, please report to the guard's<
office in the front lobby.<
<
Thank you<
```

Screen 9. A Memo Created Using RED

If you make a typing mistake while inserting text, before pressing the Return key, press the delete character key. Each time you press the delete character key, RED erases the last character you typed.

Leaving the Editor

To leave RED and return to the operating system prompt, use the Quit command. Type:

```
Q
```

RED responds with three choices as shown in Screen 10.

```
>QUIT:  Keep Abandon <DO>
        Document: A:MEMO.TXT



        Keep      - this will save any changes made
                    since the last editing session

        Abandon   - this will end editing WITHOUT
                    saving the changes made.

        <DO>      - go back to the document
```

Screen 10. The Quit Command

To store the file on the diskette, type:

```
K
```

RED responds with:

```
Keeping
A:MEMO.TXT
please stand by...
```

Printing the Memo

You can use the PIP (Peripheral Interchange Program) command to copy files to other devices, such as a printer or another diskette. If you have a printer, make sure it is connected according to the instructions in the printer manual. If you do not have a printer, skip to the next section.

> **NOTE**
> PIP also has other uses. See Chapter 2 if you want more information about PIP.

To make a printed copy of the file, the general format of the PIP command is:

PIP destination:=[drv:]file name

In this case,

- The drive (drv:) is drive A
- The destination is LST:, which is the name for the printer
- The file name is MEMO.TXT

  If you do not specify a drive with the file name, the operating system assumes the active drive: in this case, drive A.

To print the memo, type:

```
A>PIP LST:=MEMO.TXT Return
```

If any message is displayed, make sure the printer is connected properly. If the message persists, refer to Appendix B of this guide for an explanation of the message and how to solve it.

Making a Copy of the Memo on Another Diskette

You can also use the PIP command to copy files from one diskette to another diskette. This is useful if you want to make a back-up copy of a file. To make a copy of the memo on another diskette:

1. Insert a blank diskette into drive B. Be sure to insert the diskette with the orange arrow on the diskette aligned with the orange stripe on the drive.
2. Next to the prompt, type:

```
A>PIP B:=MEMO.TXT Return
```

This command line instructs the operating system to copy the file MEMO.TXT (assumed to be on drive A) onto the diskette in drive B. While the operating system is making the copy, you hear clicking sounds. When the sounds stop, Look at the directory of drive B to see if the copy was made. Type:

```
A>DIR B: Return
```

Remember that you must type a colon when you specify another drive. Screen 11 shows the entire dialog.

```
A>PIP B:=MEMO.TXT

A>DIR B:
B: MEMO.TXT
A>
```

Screen 11. Copying a File onto Drive B

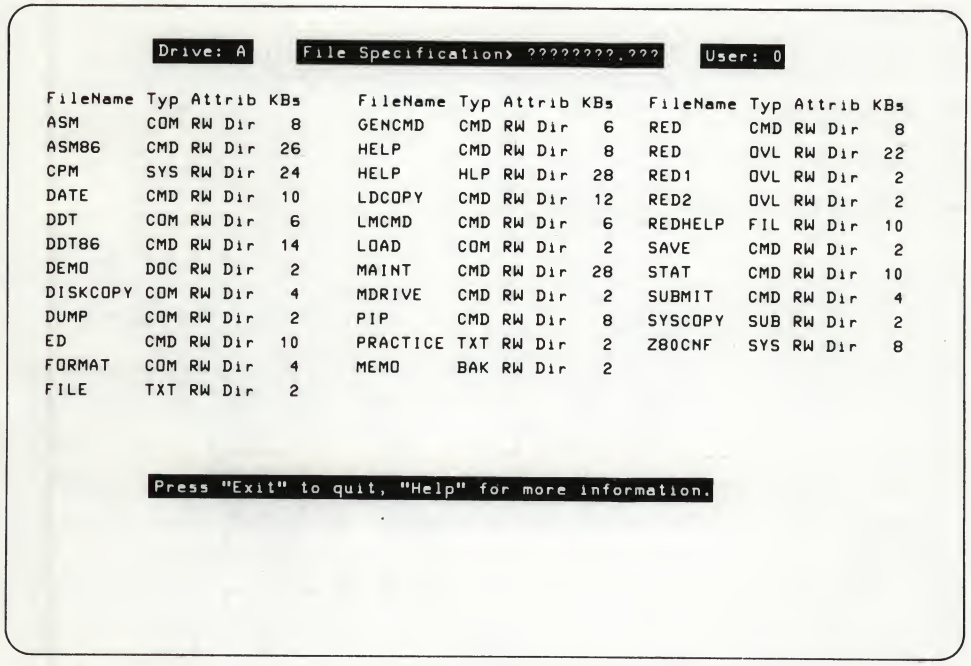
Performing Maintenance Tasks on Files

The MAINT command runs the file maintenance program, which lets you perform the routine "housekeeping" tasks associated with using diskettes, such as viewing, renaming or erasing a file. The following examples show you how to use MAINT.

First, display the file names stored on the system diskette in drive A. Type:

A> MAINT Return

MAINT replaces the text on the screen with a detailed directory of the diskette (see Screen 12).



```
Drive: A    File Specification> ????????.???    User: 0

FileName Typ Attrib KBs     FileName Typ Attrib KBs     FileName Typ Attrib KBs
ASM      COM RW Dir   8     GENCMD   CMD RW Dir   6     RED      CMD RW Dir   8
ASM86    CMD RW Dir  26     HELP     CMD RW Dir   8     RED      OVL RW Dir  22
CPM      SYS RW Dir  24     HELP     HLP RW Dir  28     RED1     OVL RW Dir   2
DATE     CMD RW Dir  10     LDCOPY   CMD RW Dir  12     RED2     OVL RW Dir   2
DDT      COM RW Dir   6     LMCMD    CMD RW Dir   6     REDHELP  FIL RW Dir  10
DDT86    CMD RW Dir  14     LOAD     COM RW Dir   2     SAVE     CMD RW Dir   2
DEMO     DOC RW Dir   2     MAINT    CMD RW Dir  28     STAT     CMD RW Dir  10
DISKCOPY COM RW Dir   4     MDRIVE   CMD RW Dir   2     SUBMIT   CMD RW Dir   4
DUMP     COM RW Dir   2     PIP      CMD RW Dir   8     SYSCOPY  SUB RW Dir   2
ED       CMD RW Dir  10     PRACTICE TXT RW Dir   2     Z80CNF   SYS RW Dir   8
FORMAT   COM RW Dir   4     MEMO     BAK RW Dir   2
FILE     TXT RW Dir   2

Press "Exit" to quit, "Help" for more information.
```

Screen 12. MAINT Command

The directory consists of the name, type, attribute, and size of each file.

> **NOTE**
> The values shown in the screens in this guide, such as the file size, displayed under the kilobyte heading (KBs), may not be the same as those on your screen. Refer to Chapter 2 for a detailed explanation of the information shown in Screen 12.

Using MAINT's special function keys shown in Figure 3, you can:

- Move the cursor
- View the contents of a specific file
- Rename a file
- Erase a file
- Cancel a command
- Return to the operating system

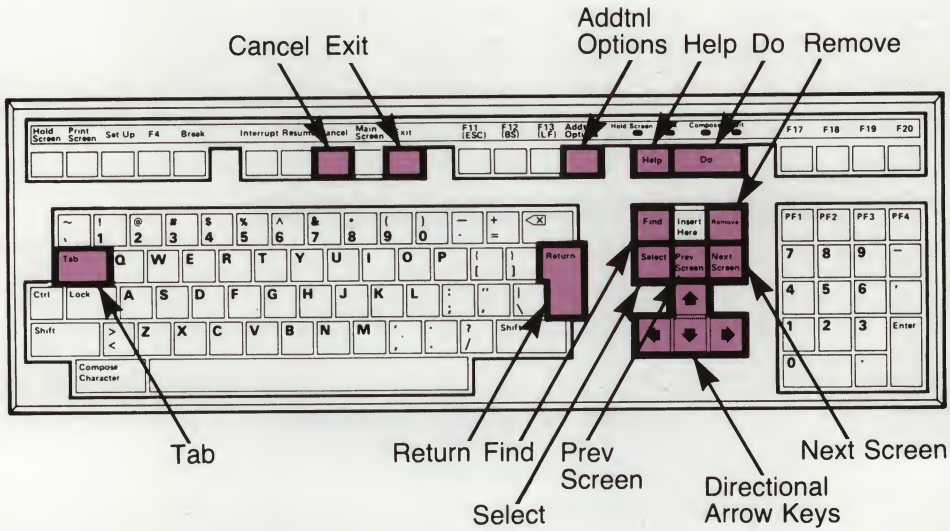


Figure 3. MAINT Keys

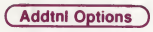
Moving the Cursor

Move the cursor by using the following keys:

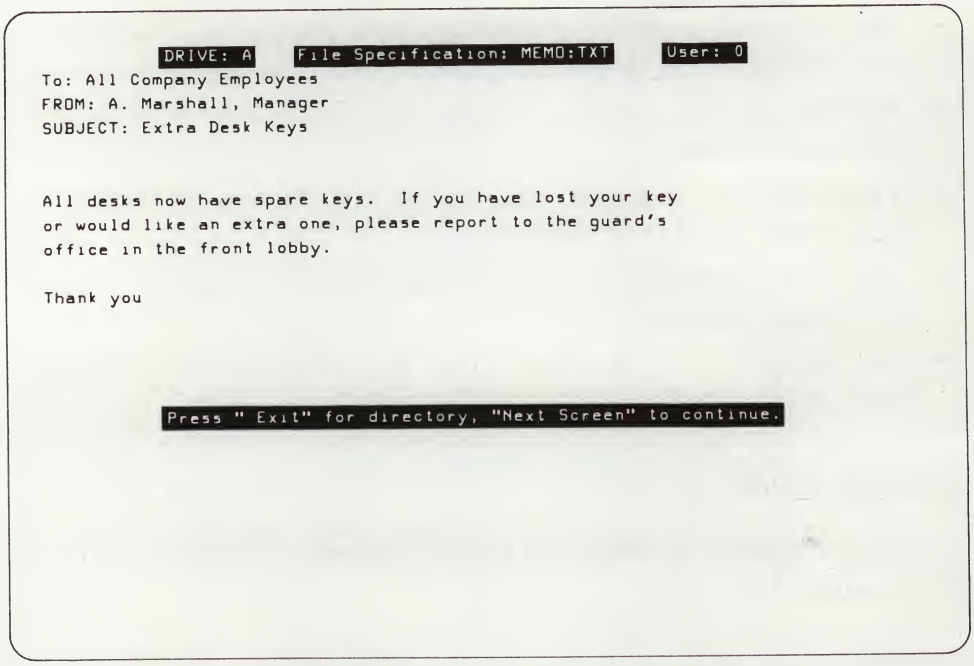
- The directional arrow keys move the cursor character-by-character in the direction of the arrows.
- The Tab key moves the cursor horizontally to the first character of the next file name.
- The Return key moves the cursor to the first character of the file entry below the current file entry.
- The Select key moves the cursor horizontally to the first character of the previous column.
- The Find key moves the cursor to the first character of the first file entry at the upper left corner of the screen.

Viewing a File

To view the contents of MEMO.TXT, move the cursor to the first letter in the file name. Then press:



MAINT replaces the directory display on the screen with the contents of MEMO.TXT (see Screen 13).



Screen 13. Displaying Contents of a File

To return to the MAINT directory, press:

Exit

located on the top row of keys above the 9 key.

Renaming a File

To rename a file, type the new name directly over the old name. To rename MEMO.TXT to FILE.TXT, move the cursor to the first letter in the file name MEMO.TXT.

Then type:

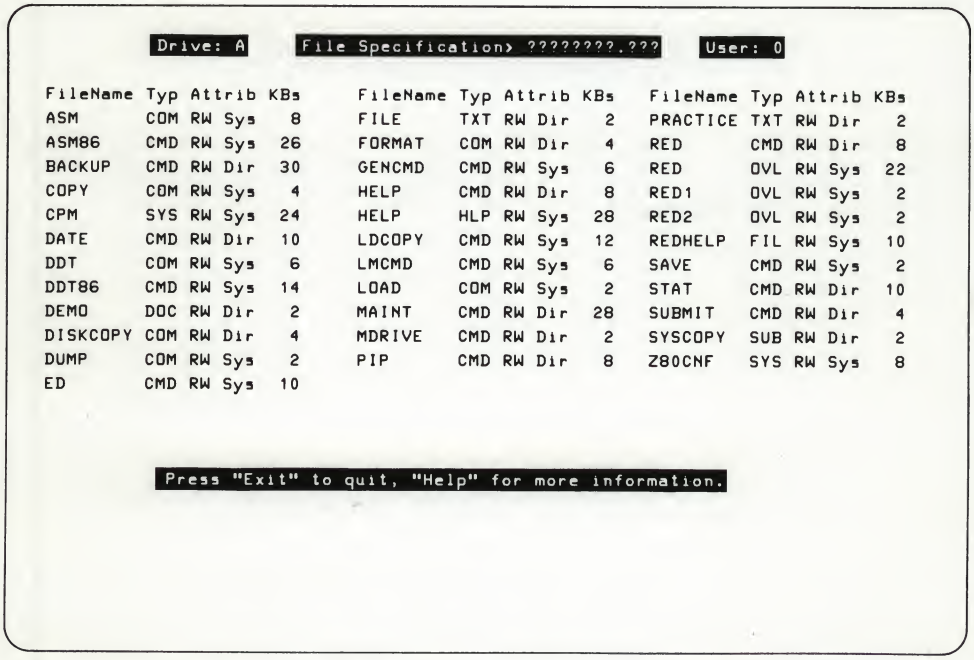
```
FILE
```

Notice that when you type the first character of the new file name (F in this case), MAINT displays the file entry in boldface characters. The boldface characters serve as a reminder that you have "marked" the file for a name change. MAINT does not rename the file until you press the Do key.

Now press:

Do

When you press the Do key, MAINT momentarily erases the screen, then displays the new directory (see Screen 14). Notice that, MEMO.TXT is no longer in the directory, but FILE.TXT is (listed alphabetically).



Screen 14. Directory After Renaming a File

Erasing a File

Eventually, space on a diskette is used up as you create text files or generate data by running programs. By using MAINT, you can erase files that are no longer needed and free up space.

To erase the file FILE.TXT, move the cursor to the first letter in the file name. Press:

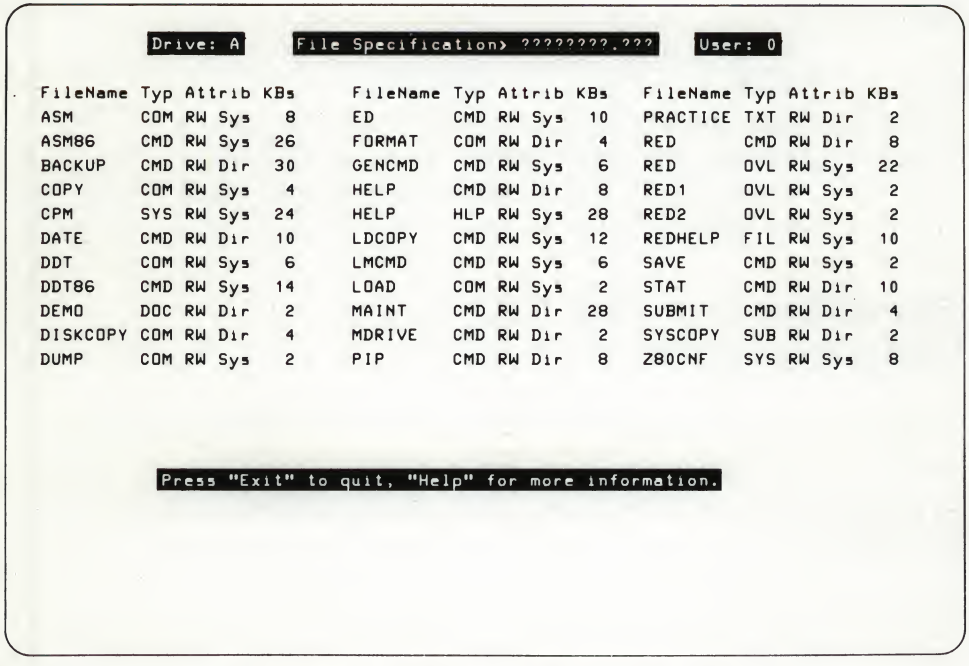
Remove

Notice that when you press the Remove key, MAINT displays the file entry in dark characters on a white background. This is called a reverse video block. A reverse video block serves as a reminder that you have "marked" the file for deletion. MAINT does not delete the file until you press the Do key.

Now Press:

Do

When you press the Do key, MAINT momentarily erases the screen. Then, MAINT displays the new directory (see Screen 15). Notice that FILE.TXT is no longer in the directory.



Screen 15. Directory After Erasing a File

Canceling a Command

If you change your mind about making changes to a file, before you press the Do key, you can press the Cancel key. The Cancel key instructs MAINT to ignore the command. The file entry is returned to its original state.

Leaving MAINT

To leave MAINT and return to the operating system, press:

Exit

MAINT replaces the directory display with the operating system prompt:

```
A>
```

The operating system is now ready to accept another instruction.

> **NOTE**
> For a quick reference to each MAINT key and its function, press the Help key from the MAINT screen. MAINT is also explained in greater detail in Chapter 2.

Requesting Help from the Operating System

If you want to use a command but have forgotten its spelling or purpose, use the HELP command or the Help key. Type:

HELP Return

or

Help

The HELP program lists all the CP/M-86/80 commands. (See Screen 16).

```
HELP UTILITY V1.0

At "HELP>" enter topic {,subtopic}...

EXAMPLE:  HELP> DIR EXAMPLES

Topics available:

ASM86       COMMANDS    CTRLKEYS    DATE        DDT86     DIR
DIRS        DISKCOPY    ERA         FILESPEC    FORMAT    GENCMD
HELP        MAINT       PIP         RED         REN       SETUP
STAT        SUBMIT      TYPE        USER

HELP>
```

Screen 16. Using the HELP Command

For information about a specific command, type the command name next to the HELP> prompt and press the Return key. HELP displays the format and purpose of the command associated with that topic. It then instructs you to:

```
Press Return to continue
```

When you press the Return key, HELP lists isubtopics available for the topic you specified. To exit from HELP, press the Return key and wait for the A> prompt to be displayed.

What To Do in Case of Trouble

If you have any trouble while using the computer, there are several steps to try, as described in the next three sections:

1. Refer to a list of messages for help.
2. Restrict the operating system.
3. Reset the computer.

Referring to the Operating System Messages

In most cases, if the computer encounters a problem, it displays a message on the screen to tell you what the problem is. Messages can be displayed for a variety of reasons. For example, if you:

- Type a command incorrectly.
- Type an invalid command.
- Forget to type Ctrl/C after changing diskettes.
- Omit some information the operating system needs in order to process the command.
- Select a nonexistent drive.

You cannot anticipate all the conditions that can cause a message. However, if you get a message:

- Check for spelling errors. If you find any, retype the command.
- Check for correct spacing and punctuation. A common error is to omit the colon (:) when specifying another diskette drive.
- Check the list of commands in Chapter 2 to determine if the command you typed is a valid CP/M-86/80 command.
- Type Ctrl/C to restart the operating system.
- Refer to Chapter 2 for further discussion of the commands or to Appendix B for a list of operating system messages, what they mean, and what to do about them.

Restarting the Operating System

If the computer is already on and you want to restart the operating system, type Ctrl/C directly after the prompt. You should restart the operating system:

- If you change diskettes in a drive. Typing Ctrl/C directly after the prompt "logs in" or tells the operating system that a new diskette has been inserted. You can change diskettes whenever the prompt is displayed and the drive lights are not lit.
- If the computer encounters some condition that causes it to stop.

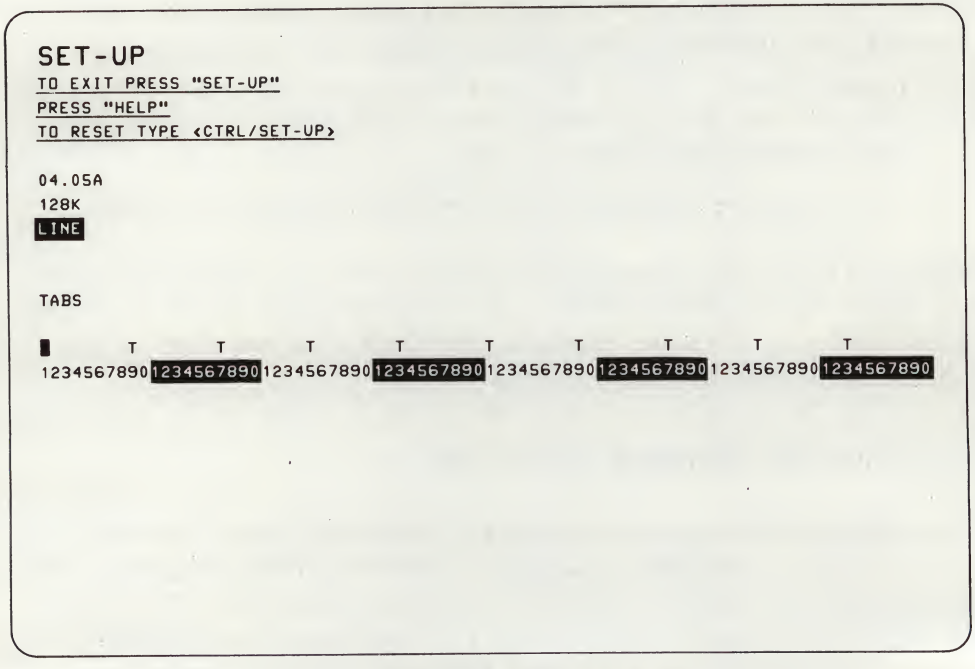
When you type Ctrl/C (shown as ^C on the screen), you should hear clicking sounds from the drive and the lights beside one or more drives turn on momentarily one at a time. After you type Ctrl/C, the operating system displays its prompt, indicating you can continue.

Resetting the Rainbow Computer

When the operating system encounters a condition it cannot deal with, it may not display a message or may not respond to any key you type. If this happens, or if you want to start over for some reason, reset the computer. Resetting the computer is like turning it off and then on again without pressing the power switch. You reset while the computer is turned on.

Diskettes may be in or out of the drives. To reset the computer:

1. Press the Set-Up key. The text in your screen should look like that in Screen 17.



Screen 17. Set-Up Display

2. Then type Ctrl/Set-Up by holding down the Ctrl key while pressing the Set-Up key.

After you press these keys, the computer displays:

```
TESTING...
```

in reverse video block (dark characters on a light background). A few seconds later, the test is completed. If no problems are detected, the computer then displays the Main System Menu.

To restart the operating system in drive A, type:

```
A
```

2

Using CP/M-86/80 Commands

This chapter is divided into two sections:

1. Section 1 explains some concepts about commands, special keys, files, and diskettes that you need to know to use the CP/M-86/80 operating system commands.
2. Section 2 discusses the most frequently used commands. The commands are listed alphabetically for easy reference.

> **NOTE**
> For information about more advanced commands, refer to Information for Advanced CP/M-86/80 Users at the end of the Preface in this guide.

Section 1
Using Commands, Keys, and Files

Using Commands

A command generally has three parts:

- The command, which is sometimes called a command keyword
- The optional command tail, which supplies the command with additional information
- The carriage return, which tells the operating system that you are finished typing the command and want to execute the command

Any combination of these parts is known as a command line. An example of a command line follows:

DIR MEMO.TXT Return

where:

DIR	Is the command
MEMO.TXT	Is the optional command tail
Return	Is the carriage return

When typing commands, exact spacing and punctuation are important. When typing the examples in this guide, type the spaces and punctuation *exactly* as they are printed. In most cases, you must type at least one space after a command to separate it from the optional command tail. Rarely is a space required between the command tail and the carriage return. Additional spacing and punctuation requirements are noted later as each command is described.

Using Special Keys

The following keys are special function keys that are used by the CP/M-86/80 operating system.

Backspace

The backspace key, located in the top row of keys and labeled (BS) on the label strip, moves the cursor to the left and erases the last character. Backspace works the same as the delete character key.

Delete Character

The delete character key, located above the Return key and labeled with an X, erases the last character you typed and moves the cursor back a space. Delete character works the same as the Backspace key.

Return or Line Feed

Pressing either of these two keys tells the operating system that you finished typing a command and want the command executed.

Hold Screen

The Hold Screen key allows you to look at what is on the screen without changing it. This key is useful for long files that occupy more than one screen. The Hold Screen key stops the normal scrolling of a multi-page file after you use the TYPE command. This also means that if you type any additional characters, they are not displayed until you press the Hold Screen key again. The Hold Screen light, located above the Help key, turns on when you press the Hold Screen key.

CAUTION
If you press the Hold Screen key while printing text on a printer, the following occurs:

a. Printing stops until the Hold Screen key is pressed again.

b. When printing resumes, extra lines or text may be displayed.

Control

The control key, Ctrl on the keyboard, is a special key used in conjunction with certain other keys. When the control key is combined with these other keys, a simple command is sent to the CP/M-86/80 operating system.

To enter control commands, hold down the control key while you press the required letter or number key.

Table 1 lists the control keys used by the CP/M-86/80 operating system and, their function.

Table 1. Control Keys

Control Key	Function Performed
Ctrl/C	Stops a program if it is processing any console in or out commands; reinitializes the operating system if typed alone on a command line; initializes a new diskette.
Ctrl/H	Moves the cursor to the left and erases the character; works the same as the backspace and delete character keys.
Ctrl/I	Inserts eight spaces; works the same as the Tab key.
Ctrl/J	Stops the display on the screen; works like the Return key and line feed key, labeled (LF) on the keyboard label strip.
Ctrl/M	Works the same as the Return key.
Ctrl/P	Prints, on the printer, everything that is written to the screen; a second Ctrl/P ends the repetition. This only works if the Rainbow computer is connected to a printer.
Ctrl/Q	Restarts scrolling if stopped by a Ctrl/S. Will not restart scrolling if scrolling was stopped by the Hold Screen key.
Ctrl/R	Retypes the current command line; does not send the command to the operating system.
Ctrl/S	Stops console scrolling temporarily until Ctrl/Q is pressed; works the same as the Hold Screen key.
Ctrl/U	Cancels the command and displays a #. The cursor moves down one line, and the operating system waits for a new command.
Ctrl/X	Deletes all characters in the command line.
Ctrl/Z	Ends a character sequence.

Using Files

Most commands are designed to act on files. To correctly identify which file you want the command to act on, you should include a file specification as part of the command tail. A file specification includes the following three parts:

- The location of a file, that is, which drive the diskette containing the file resides in. If you do not specify a drive, the operating system assumes the file is on the active drive. If the file is not found on the active drive, the operating system automatically searches all drives. If you want to specify a drive other than the active one, type the letter of the drive followed by a colon (:). The drive letter is also known as the drive specifier.
- The "first name" of the file (the file name).
- The "last name" of the file (the file type or the file extension). File types are often used to describe the file's class. For example, .CMD and .COM file types identify programs that you can run by typing the file name.

When you refer to a file, you must separate the file name and file type with a period. An example of a file specification is:

A:MEMO.TXT

where:

A:	Is the file's location: the diskette in drive A
MEMO	Is the file name
TXT	Is the file type

Naming Files

Use the following conventions when naming files.

- The file name and file type can include any combination of letters, numbers, and printable symbols except:

  < > . , ; : = * ? [ ]

- The file name can include from one to eight characters. The operating system ignores any characters after the eighth one.
- The file type can include from one to three characters. The operating system ignores any characters after the third one. The use of a file type is optional; however, it is suggested that you use file types to easily identify classes of files.

Some examples of valid file names are:

MEMO.DOC	X.Y
PHONE.LIS	1
GAMMARAY.1	PAY-ROLL.+

Using File References

A file reference identifies a particular file or group of files on a diskette. The CP/M-86/80 operating system accepts references for two kinds of file names:

- Unambiguous file names, which identify a specific file.
- Ambiguous file names, which identify one or more files meeting certain criteria.

Ambiguous file references are useful when you want to:

- Find a file whose exact name you have forgotten
- Enter a command that acts on several files at once

You use ambiguous file references by substituting a question mark (?) or an asterisk (*) for part of an unambiguous file name as follows:

- A question mark matches any single character in the same position as the question mark.
- An asterisk matches part of or all of an entire file name or file type. The asterisk could match from one to eight characters in the file name and from one to three characters in the file type.

These two ambiguous file references (? and *) are also known as wildcards.

To see how the wildcards work, try the following examples.

1. To list all the files on the diskette in drive A that *begin with the letter M and have a .CMD file type* (see Screen 18a), type:

   ```
   A>DIR M???????.CMD Return
   ```

   or

   ```
   DIR M*.CMD Return
   ```

```
A>DIR M???????.CMD
A: MAINT    CMD : MDRIVE   CMD
A>
```

Screen 18a. Using the Wildcard ?

2. To list *all the files* on the diskette in drive A *with a .CMD file type* (see Screen 18b), type:

```
A>DIR *.CMD Return
```

```
A>DIR *.CMD
A: BACKUP   CMD : DATE     CMD : HELP   CMD : MAINT     CMD
A: MDRIVE   CMD : PIP      CMD : RED    CMD : STAT      CMD
A: SUBMIT   CMD

SYSTEM FILE(S) EXIST
A>
```

Screen 18b. Using the Wildcard *

Storing Information on Diskettes

The CP/M-86/80 operating system stores files on a diskette in much the same way that you store files in a filing cabinet.

- When you create a memo using a typewriter, you store it in a folder in a filing cabinet.
- When you create a memo on the computer using a text-editing program, such as RED, the operating system stores the file electronically on the diskette.

Figure 4 shows the files INFO.TXT and FILE.TXT stored in a filing cabinet. Figure 5 shows the same two files stored on a diskette. (Refer to Appendix A, at your leisure, for more information about storing information on diskettes.)

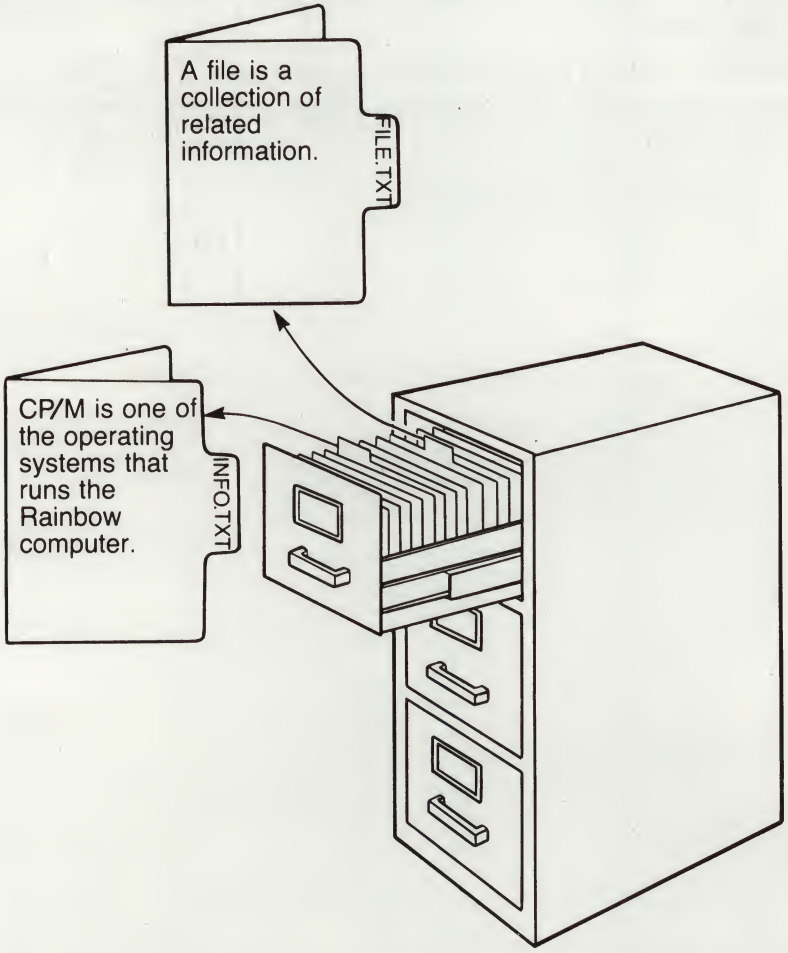


Figure 4. Storing Information in a Filing Cabinet

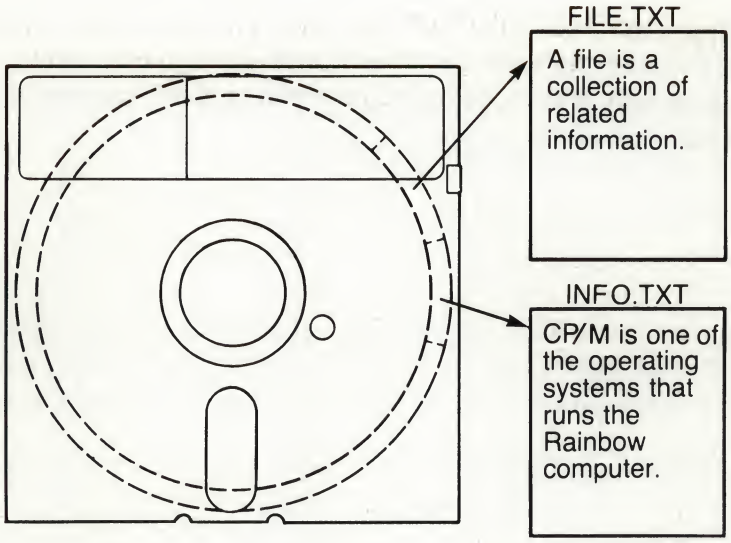


Figure 5. Storing Information on a Diskette

Attributes

An attribute describes the characteristics of a file or a drive. The operating system uses attributes to describe and control:

- How files are stored and accessed
- How drives are accessed

You can display and change the attributes of a file or drive by using the STAT or MAINT commands. (Refer to the discussions of these commands in Section 2 of this chapter to learn how to display and change attributes.)

The CP/M-86/80 operating system deals with the following four attributes:

1. Directory (Dir)
2. System (Sys)
3. Read Write (RW)
4. Read Only (RO)

File Attributes

The operating system automatically assigns two attributes to a file that you create, as well as the files that come with your operating system diskette:

- The Directory Attribute (Dir)
- The Read Write Attribute (RW)

These attributes remain in effect until you change them.

Directory Attribute. The Directory Attribute ensures that the operating system stores the file name in the main directory. Whenever you type the DIR command, the operating system displays the file names in the main directory. The Directory Attribute also controls the availability of the file.

Read Write Attribute. The Read Write Attribute controls what you can do to the file. Because the file has the Read Write Attribute, you can:

- Read the file
- Make changes to the file
- Erase the file
- Rename the file

> **NOTE**
> You can access the file in any of the preceding ways providing a write-protect tab does not cover the diskette's write-protect notch or the diskette does not reside in a drive that is write protected. How to assign an attribute to a drive is explained later in this chapter.

If you wish, you can change these attributes to one or both of the following attributes by using the STAT or MAINT commands:

- The System Attribute (Sys)
- The Read Only Attribute (RO)

System Attribute. The System Attribute ensures that the operating system stores the file name in the system directory. The system directory is a special directory containing only those files having the System Attribute. To display the files having the System Attribute, you type the DIRS command. The operating system does not list those file names having the System Attribute in response to a DIR command.

The CP/M-86/80 master system diskette you received in the software kit contains the following files in the system directory (with the System Attribute):

```
CPM.SYS       Z80CNF.SYS    ASM.COM       ASM86.CMD
DDT.COM       DDT86.CMD     DUMP.COM      ED.CMD
GENCMD.CMD    HELP.HLP      LDCOPY.CMD    LMCMD.CMD
LOAD.COM      RED.OVL       RED1.OVL      RED2.OVL
REDHELP.FIL   SAVE.CMD      COPY.COM
```

The System Attribute also controls the availability of the file.

Assigning the System Attribute to files is useful if:

- You want to use a program or file while in any user number.
- You have a large directory and want to store programs or files in another directory so that the main directory is not cluttered.

Read Only Attribute. The Read Only Attribute controls what you can do to a file. Because the file has the Read Only Attribute, you can only read the file. You *cannot*:

- Make changes to the file
- Erase the file
- Rename the file

Assigning the Read Only Attribute to files is useful if you want to protect them from accidental deletion.

Drive Attributes. The operating system also assigns a Read Write Attribute to drives. This attribute remains in effect until you change it. Unless you change the Read Write Attribute, all files on any diskette in the drive can be:

- Read
- Changed
- Erased
- Renamed

However, this attribute is overridden if a file has the Read Only Attribute or if the diskette has a write-protect tab on the write-protect notch. The write-protect tab has priority over the write-protect status of a diskette or a file.

You can temporarily change a drive's Read Write Attribute to the Read Only Attribute by using the STAT command. (Refer to Section 2 of this chapter for more information about the STAT command.) The files residing on a diskette in a Read Only drive are protected from being accidentally deleted or changed.

It is not a good idea to assign the Read Only Attribute to a drive to protect files, because the protection is only temporary. The Read Only Attribute of a drive is reversed by typing Ctrl/C. Because you type Ctrl/C to reinitialize the operating system, you can easily reverse the Read Only Attribute without realizing it. If you want to protect all files on a diskette, place a write-protect tab on the write-protect notch of the diskette.

Section 2
CP/M-86/80 Operating System Commands

The operating system has two types of commands: built-in and transient. Table 2 lists the characteristics of transient and built-in commands.

Table 2. Transient and Built-in Command Characteristics

Built-in Commands	Transient Commands
Not shown on directory	Shown on directory
Always stored in the computer; automatically read into the computer at start-up	Stored as files on a diskette; read into the computer only when requested
Can be used at any time regardless of which diskette or user number is being used	Can only be used if the requested file exists on the active diskette or if you specify the diskette where the the file exists

When you type a command, the operating system does one of the following:

- Finds the command in the computer and runs the command immediately (built-in).
- Displays the command you typed followed by a question mark (?) if the command cannot be found in the computer or on the diskette. Usually, this happens because you mistyped a command.
- Finds the program file associated with the command on the diskette; reads the program file into the computer and runs it (transient). (For example, the command PIP runs the program PIP.CMD.)

If the operating system cannot find the transient program file on the active drive, it automatically looks on the drive from which you started the operating system. In some cases, the command you type results in a report of both drives. For example, if you start the operating system form drive A, and then you work from a diskette in drive B, when you use the STAT command, the operating system displays the diskette information for both drive A and B. The following is an example:

```
A>B: Return
B>STAT Return

A: RW, Free Space:      70k
B: RW, Free Space:     352k

B>
```

Table 3 lists the commands discussed in this chapter, as well as RED, which is described in Chapter 3.

Table 3. CP/M-86/80 Operating System Commands

Command	Use
BACKUP	Copies the indicated file from the hard disk to a set of diskettes, or from the diskettes to the hard disk (See chapters 5 and 6 for information on this program.)
DATE	Displays or sets the date and time
DIR	Displays files with the Directory Attribute
DIRS	Displays files with the System Attribute
DISKCOPY	Reproduces the entire contents of one Rainbow diskette on another
ERA	Erases a file
FORMAT	Formats a blank diskette for use by CP/M-86/80 on a Rainbow computer
HELP	Displays summary information, on the screen, about a command
MAINT	Renames, erases, changes the attributes of files, or displays the contents of a file. MAINT can be used in place of DIR, DIRS, ERA, REN, STAT, or TYPE
MDRIVE	Installs and configures the memory drive (M:)
PIP	Transfers one or more files from one device to another, for example, from a diskette to another diskette, or from a diskette to a printer
RED	Creates or edits a file
REN	Changes the name of a file
STAT	Displays information about files, drives, and other components of the computer
SUBMIT	Executes a series of commands through one command
TYPE	Displays the contents of a text file
USER	Displays and changes the current user number

The commands listed in Table 4 are mainly for programmers. They are stored on the CP/M-86/80 master system diskette in the system directory. For information about these commands, refer to the Rainbow Technical Documentation Kit, explained at the end of the Preface in this guide.

Table 4. Additional Commands

Command	Use
ASM	Assembles CP/M-80 programs
ASM86	Assembles CP/M-86 programs
DDT	Debugs CP/M-80 programs
DDT86	Debugs CP/M-86 programs
DUMP	Displays files in hexadecimal form
ED	Creates and edits files
GENCMD	Produces command files (.CMD) from hexadecimal files
LDCOPY	Copies the two reserved system tracks from one diskette to another
LMCMD	Produces command files (.CMD) from Intel-L module files
LOAD	Produces command files (.COM) from hexadecimal files
SAVE	Saves CP/M-80 programs in memory as a file on the diskette

NOTE
DUMP displays files in hexadecimal form. DUMP attempts to interpret the file's contents in 7-bit ASCII codes or optionally in DIGITALs 8-bit multinational character set.

To display the file in 7-bit ASCII code, type the following command:

```
DUMP [drv:]filename.typ Return
```

To display the file in DIGITALs 8-bit multinational character set, type the following command:

```
DUMP [drv:]filename.typ 8 Return
```

Conventions Used

Table 5 lists the conventions used in the discussions of the commands.

Table 5. Conventions

Convention	Meaning
n	Number
filename	File name (maximum of eight characters)
.typ	File type (maximum of three characters)
filespec	File specification (maximum of 14 characters: two for drive name, eight for file name, one period separator, three for file type)
drv:	Valid drive name as follows: A: or B: for the two standard drives C: or D: if the optional drives are installed E:, F:, G:, or H: if the optional hard disk is installed in place of C: and D: M: if MDRIVE is configured
atr	Attribute (RO, RW, Dir, Sys)
[p]	Parameter used with PIP
dev	Device
dev1	First device
dev2	Second device
logdev	Logical device
phydev	Physical device

Optional portions of a command are shown in brackets, [ ], which you do not type. Note, however, that when you include optional parameters with the PIP command, you must also include the brackets.

DATE

Purpose

DATE is a transient command that displays the current date and time or allows you to set the date and time.

Form

DATE [dd-mon-yy hh:mm:ss] [P] Return

Instructions

Type the command followed by the optional date and time. The date is represented as:

day-first 3 letters of month-last 2 digits of year

For example,

23-jul-83

Time is represented as a twenty-four hour clock with hour values from 00 to 11 for the morning, and 12 to 23 for the afternoon and evening. If you omit the date and time, DATE displays the current date and time. If you include the P option, DATE displays the current date and time continuously until you press any key.

Examples

The following examples assume drive A is the active drive.

1. Display the current date and time:

```
A>DATE Return
```

2. Set the date and time to 10:30 a.m. on the sixth of June, 1983:

```
A>DATE 06-jun-83 10:30:00 Return
```

3. Display the current date and time continuously:

```
A>DATE P Return
```

DIR

Purpose

DIR is a built-in command that displays a list of file names having the Directory Attribute.

Form

DIR [drv:][filename.typ] Return

Instructions

Type the command followed by the optional drive name, file name, and file type. If you omit the drive name, DIR assumes the active drive. If you omit a file name and file type, DIR displays all file names on the specified diskette that have the Directory Attribute. DIR accepts wildcards (? and *) in the file name and file type. If the diskette includes files with the System Attribute, and you request a complete directory by typing DIR without a file name, DIR displays the following message after the directory:

```
SYSTEM FILE(S) EXIST
```

Examples

The following examples assume drive A is the active drive.

1. Display a complete directory of file names having the Directory Attribute:

   ```
   A>DIR Return
   ```

2. Display the directory of the file SHOW.SUB having the Directory Attribute:

   ```
   A>DIR SHOW.SUB Return
   ```

3. Display a directory of all files with the file name HELP having the Directory Attribute:

```
A>DIR HELP.* Return
```

4. Display a directory of all files on the diskette in drive B with the file type .TXT having the Directory Attribute:

```
A>DIR B:*.TXT Return
```

DIRS

Purpose

DIRS is a built-in command that displays a list of file names having the System Attribute.

Form

DIRS [drv:][filename.typ] Return

Instructions

Type the command followed by the optional drive name, file name, and file type. If you omit the drive name, DIRS assumes the active drive. If you omit a file name and file type, DIRS displays all file names on the specified diskette that have the System Attribute. DIRS accepts wildcards in the file name and file type. If the diskette includes files with the Directory Attribute, and you request a complete directory by typing DIRS without a file name, DIRS displays the following message after displaying the directory:

```
NON-SYSTEM FILE(S) EXIST
```

Examples

The following examples assume drive A is the active drive.

1. Display a complete directory of file names having the System Attribute:

   ```
   A>DIRS Return
   ```

2. Display the directory of the file SHOW.SUB having the System Attribute:

   ```
   A>DIRS SHOW.SUB Return
   ```

3. Display a directory of all files with the file name HELP having the System Attribute:

```
A>DIRS HELP.* Return
```

4. Display a directory of all files on the diskette in drive B with the file type .CMD having the System Attribute:

```
A>DIRS B:*.CMD Return
```

NOTE
If you request the directory listing of a file that does not exist, the computer displays:

```
NO FILE
```

DISKCOPY

Purpose

DISKCOPY is a transient command that reproduces the entire contents of one Rainbow diskette to another Rainbow diskette. Use this command to make back-up copies of:

- The CP/M-86/80 system diskette
- Application program diskettes
- Data diskettes

> **NOTE**
> Use DISKCOPY with caution. If there are already files on the destination diskette (the diskette to which you are copying the files), these files will be erased and replaced with the new files from the source diskette.

Form

DISKCOPY Return

Instructions

Type the command and answer the questions that the DISKCOPY program asks you. DISKCOPY copies the diskette in drive A to the diskette in drive B unless you specify other source and destination drives. You can make additional copies of the source diskette after the first copy is made without exiting from the program.

The computer beeps if you press an invalid key while answering the DISKCOPY questions. The character is not displayed on the screen. Press the correct key if this occurs.

Press the Exit key if you want to stop the program and return to the operating system. If you press the Exit key during the copying process, the program stops.

If you are copying a data diskette on a two-drive computer, remove the system diskette from its drive when the program asks you to insert the source and destination diskettes. Insert the data diskette you want to copy from and then press the Y key to start the copying process. The program is now stored in the computer and the copying process can proceed even though the system diskette is no longer inserted in the drive. The program later instructs you to reinsert the system diskette into the drive.

The destination diskette cannot have a write-protect tab on the write-protect notch.

If the DISKCOPY program stops for any reason,

- Correct the problem and run DISKCOPY again.
- Discard the diskette if the DISKCOPY program stops again.

Example

Copy the operating system diskette in drive A (source diskette) to a blank diskette in drive B (destination diskette).

1. Type:

```
A>DISKCOPY (Return)
```

The program displays:

```
Copy from source diskette in drive A
  to destination diskette in drive B



Are the drives correct? (Y/N)
```

2. Press:

```
Y
```

The program displays a message appropriate to your selection. This example uses A as the source diskette and B as the destination diskette, so DISKCOPY displays:

```
Insert source diskette into drive A
Insert destination diskette into drive B

Ready to start copying? (Y/N)
```

At this point, if you want to:

- **Copy a data diskette on a two-drive computer**, remove the system diskette from drive A and insert the new source diskette into drive A.
- **Change the source or destination diskette**, press the N key. The program asks you to select the source drive (A through D). The program then asks you to select the destination drive, giving you the same choices minus the one you selected for the source diskette.
- Copy the diskette in drive A to the diskette in drive B, press the Y key.

3. For this example, press:

```
Y
```

The program displays:

```
Copying all tracks

Reading track tt    Writing track tt
```

The characters, tt, indicate which of the 80 tracks (numbered 0-79) is currently being read or written.

When the copying process is complete, DISKCOPY displays a message appropriate to your response. This example uses B as the destination diskette, so DISKCOPY displays:

```
Copy/Verify complete to drive B

Do you want another copy? (Y/N)
```

In this example, you have made a single copy of the source diskette. If you want to make more copies, press the Y key. Then remove the diskette from the destination drive and insert another blank diskette. DISKCOPY then asks you if you want to copy the diskette in drive A to the diskette in drive B again. Repeat the steps listed above.

Because this example makes a single copy of the source diskette, proceed to step 4.

4. Press:

```
N
```

The program displays:

```
INSERT CP/M-86/80 SYSTEM DISKETTE then press the Exit key.
```

5. Press:

Exit

NOTE

If you have copied a data diskette, insert the system diskette before pressing the Exit key. The system diskette is automatically "logged in" when you press the Exit key.

The program ends and the operating system displays its prompt:

```
A>
```

IMPORTANT
If you look at a directory (refer to the DIR command) of the newly copied diskette, all the copied file names are listed. However, if, for any reason, the DISKCOPY operation did not complete, the contents of some of the file names listed may not exist. In such a case, erase all file names from the diskette (refer to the ERA command) and run DISKCOPY again.

ERA

Purpose

ERA is a built-in command that erases a file or group of files from a diskette directory.

> **CAUTION**
> Use ERA with care because erased files cannot be restored.

To protect files from accidental deletion:

- Place a write-protect tab on the diskette's write-protect notch. The tab protects *all* files on the diskette. (Refer to Appendix A).
- Set the file(s) to the Read Only Attribute. (Refer to the discussions of the MAINT or STAT commands.)
- Keep back-up copies of the diskettes. (Refer to the discussion of the DISKCOPY command.)

Form

ERA [drv:]filename.typ Return

Instructions

Type the command followed by the optional drive name, the file name, and the file type. If you omit the drive name, ERA assumes the active drive.

ERA accepts wildcards in the file name and file type. Verify a deletion by using the DIR or DIRS command.

When you type a command to erase all files on a diskette, ERA displays the following message to confirm that you want to erase all the files.

```
ALL (Y/N)?
```

To erase all the files, type:

```
Y Return
```

To stop the command without erasing any files, type:

```
N Return
```

Examples

The following examples assume drive A is the active drive.

1. Erase the file TEST.TXT:

   ```
   A>ERA TEST.TXT Return
   ```

2. Erase all files with the file type .TXT:

   ```
   A>ERA *.TXT Return
   ```

3. Erase all files:

   ```
   A>ERA *.* Return
   ALL (Y/N)? Y Return
   ```

4. Erase all the files with the file name TEST on the diskette in drive B:

   ```
   A>ERA B:TEST.* Return
   ```

FORMAT

Purpose

FORMAT is a transient command that prepares a blank diskette for file storage and use by CP/M-86/80 on the Rainbow computer.

Form

FORMAT Return

Instructions

Type the command and answer the questions that the FORMAT program asks you. FORMAT prepares the diskette in drive B unless an alternate destination drive is specified.

The computer beeps if you press an invalid key, and the key is ignored. The character is not displayed on the screen. Press the correct key if this occurs.

Press the Exit key if you want to stop the program and return to the operating system. If you press the Exit key during the formatting process, the program stops.

Insert the diskette you want to format and then press the Y key to start the formatting process.

The destination diskette cannot have a write-protect tab on the write-protect notch.

> **CAUTION**
> FORMAT will destroy any existing information on the destination diskette.

Example

Type:

```
A>FORMAT (Return)
```

The program displays an introductory message at the top half of the screen followed by:

```
Selected Drive: B

Select drive for formatting (A, B, C, D, or (Return) for NO CHANGE)
```

The program then displayes a message appropriate to your selection.

FORMAT then asks if you are:

```
Ready to format diskette in selected drive? (Y/N)
```

At this point you can:

- Format the diskette in drive B by typing

  ```
  Y
  ```

- Change the selected drive by typing

  ```
  N
  ```

The program repeats the instruction to select a drive.

If you type Y, the program displays:

```
Formating  all tracks
```

After a few seconds during which you hear clicking sounds, FORMAT displays:

```
Verifying all tracks
```

Assuming you selected drive B, when the formatting process is complete, FORMAT displays:

```
Format/Verify complete to drive B

Do you want to format another diskette? (Y/N)
```

If you want to format more diskettes, type Y. Otherwise, type N.

FORMAT displays:

```
Insert CP/M-86/80 SYSTEM DISKETTE then press Exit
```

Press:

Exit

The program ends and the operating system displays its prompt:

```
A>
```

HELP

Purpose

HELP is a transient command that displays summarized information about the following CP/M-86/80 topics and subtopics:

ASM86/Examples	USER/Examples
DIR/Example	STAT/Options/Examples
PIP/Options/Examples	DISKCOPY
TYPE/Examples	ERA/Examples
COMMANDS/Table	DDT86/Commands/Parameters/Examples
DIRS/Examples	REN/Examples
RED/Commands/Keys	CTRLKEYS/Table
MAINT/Keys/Examples	GENCMD/Examples
SETUP/Keys	SUBMIT/Examples
DATE/Examples	HELP
FILESPEC	FORMAT

Form

HELP [topic] [subtopic] Return

where:

HELP	Displays a list of topics for which information is available.
HELP [topic]	Displays information about the specified topic and a list of available subtopics.
HELP [topic] [subtopic]	Displays information about the specified subtopic.

Instructions

There are two ways to use the HELP command:

- **Type the command followed by any desired topic or topic and subtopic**; for example:

  A>HELP ERA (Return)

  HELP displays information about ERA and then lists the additional options.

- **Type the command alone.** HELP displays its own prompt, HELP>. Then type enough characters of any desired topic, or topic and subtopic, to make it unique. For example, to display information about MAINT keys, type:

  A>HELP (Return)
  HELP>M K (Return)

Press the Return key next to the HELP prompt to return to the operating system prompt.

> **NOTE**
> You can also use the Help key located in the top row of keys. When you press the Help key, the same list of topics is displayed, followed by the HELP> prompt.

Examples

The following examples assume drive A is the active drive.

1. Display a list of available topics:

```
A>HELP Return
```

2. Display information about the ERA command and display the available subtopics:

```
A>HELP ERA Return
```

3. Display examples (a subtopic) of the ERA command:

```
A>HELP ERA EXAMPLES Return
```

4. Display information on how to use HELP:

```
A>HELP HELP Return
```

5. Display more than one subtopic without returning to the operating system in between:

```
A>HELP Return
   .
   .
   .
HELP>DISKCOPY Return
   .
   .
   .
HELP>ERA EXAMPLES Return
   .
   .
   .
HELP> Return
A>
```

MAINT

Purpose

MAINT is a transient command that runs the file maintenance program. MAINT lets you perform the routine "housekeeping" tasks associated with using a diskette. MAINT combines the functions of the TYPE, DIR, DIRS, ERA, REN, and STAT commands.

MAINT displays the directory of the active diskette one screen at a time. While viewing the directory, you can move the cursor from file to file and select as many files as you want for changes. You can implement all the changes at one time by pressing the Do key. You can cancel the last file selected for changes (before pressing the Do key) by pressing the Cancel key, or all files selected for changes by pressing the Exit key.

While using MAINT, you can:

- Change file names, file types, or attributes
- Delete files
- Page through the directory forward and backward
- Get information about a diskette
- Display the contents of text files

Refer to Screens 12 through 15 in Chapter 1 of this guide for visual examples of using MAINT.

MAINT is particularly useful if you have a large directory and want to erase unneeded files. Normally, you would:

1. List all the files (with the directory attribute) on the diskette by using the DIR command
2. Write down or "mark" on paper all the files you want to delete
3. Erase each file one by one using the ERA command

To do this using MAINT, you can:

1. List all the files on the diskette.

   NOTE
   MAINT lists *all* the files on the diskette, where DIR only lists the files with the directory attribute.

2. Use special function keys to move the cursor to the files that you want to delete
3. Select each file for deletion by pressing the Remove key
4. Press the Do key to delete all the files that you selected

Form

MAINT [drv:][filename.typ] Return

Instructions

Type the command followed by the optional drive name, file name, and file type. If you omit the drive name, MAINT assumes the active drive. If you omit a file name and file type, MAINT displays all file names on the specified diskette having both the Directory and System Attributes. MAINT accepts wildcards in the file name and file type.

The computer beeps whenever you press a key that MAINT does not recognize, or whenever you try to make a change that is invalid (such as deleting a Read Only file).

While using MAINT, you cannot:

1. Rename, erase, or change the attributes of files that:
   - Have the Read Only Attribute
   - Reside in a drive that has the Read Only Attribute
   - Are stored on a diskette that has a write-protect tab on it

2. Make more than one change to a file at a time. You must complete the first change before making a second change.
3. Change a file size.

Running MAINT. After you type the command, MAINT displays the first screen or "page" (19 lines) of the diskette's directory.

The first line of the directory lists the drive, file specification, and user number within a reverse video block (dark characters on a light background). At the bottom of the screen, MAINT displays the following line within a reverse video block:

```
Press "Exit" to quit, "Help" for more information.
```

MAINT displays these lines on each page of the directory including the diskette summary.

If you press the Exit key, you are returned to the operating system prompt.

If you press the Help key, MAINT replaces the current directory display with a list of MAINT keys and functions. To return to the current directory, press any key.

> **NOTE**
> If you specify a nonexistent file or if there are no files stored on the diskette, MAINT displays the diskette summary.

MAINT displays the directory in a three-column, alphabetized format. The following header is displayed at the top of each column:

```
FileName Typ Attrib KBs
-----------------------
```

where:

FileName	Is the file name
Typ	Is the file type
Attrib	Are the file's attributes
KBs	Is the file's size in kilobytes

NOTE
A byte is the amount of memory required to store one character; a kilobyte is 1024 bytes. You can store 386 kilobytes on a Rainbow diskette, or about 150 pages of text.

After MAINT displays the first screen of the directory, you can "page" through the directory, forward and backward, using the Prev Screen and Next Screen keys. If the diskette's directory fits onto one page, pressing the Next Screen or the Prev Screen key causes MAINT to display the diskette summary. (The diskette summary is the last page of any directory.) MAINT displays the following information about the diskette:

```
File Space  Allocation Summary
------------------------------
                   KBs  FCBs
                   ---  ----
   This User    :
   Other Users  :
   Available    :
   Total        :

Diskette Access:  R/W
```

where:

KBs	the number of kilobytes used
FCBs	The number of file control blocks used
This User:	The number of KBs and FCBs used by the current user number
Other Users:	The number of KBs and FCBs used by other user numbers
Available:	The total number of KBs and FCBs available
Total:	The total number of KBs and FCBs used by all user numbers
Diskette Access:	The attribute (access mode) of the drive

NOTE
A file control block contains the information necessary for the operating system to access the file, such as the file name, file type, and file size.

Positioning the Cursor. To use the various functions of MAINT, you must tell MAINT which file to act on. To do this, you move the cursor to different positions within the desired file entry. A file entry consists of the file Name, Typ, Attrib, and KBs (kilobytes).

After you move the cursor to the desired file entry, you can then use the special function keys to perform the different housekeeping tasks. Table 6 lists the cursor control keys and the special function keys used by MAINT; Figure 6 shows the location of these keys on the keyboard.

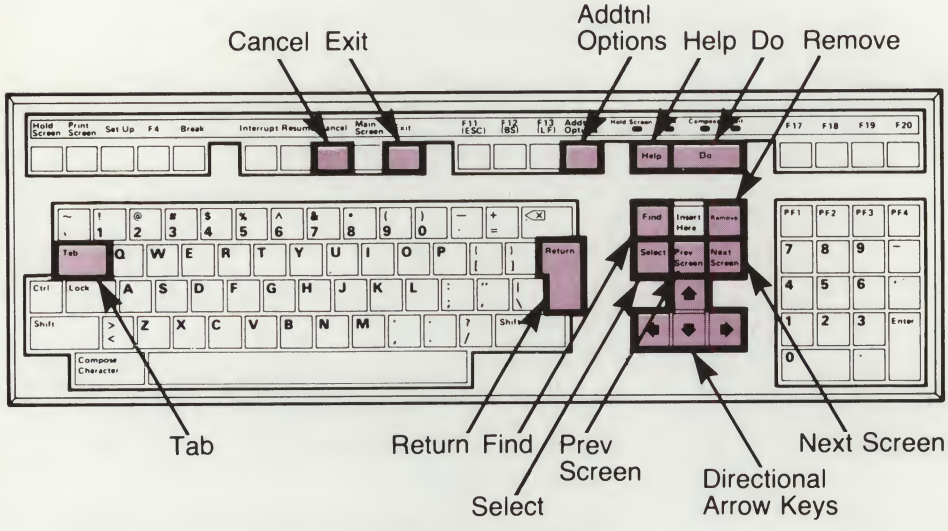


Figure 6. MAINT Keys

Table 6. MAINT Keys

Key	Function
Up Arrow (↑)	Moves the cursor up one line at a time.
Down Arrow (↓)	Moves the cursor down one line at a time.
Right Arrow (→)	Moves the cursor right one character at a time.
Left Arrow (←)	Moves the cursor left one character at a time.
Tab	Moves the cursor horizontally to the first character of the next file entry.
Return	Moves the cursor to the first character of the next line in the current column.
Next Screen	Displays the next page of the directory; displays the next page of a text file.
Prev Screen	Displays the previous page of the directory.
Remove	"Marks" a file for deletion by displaying the file name and attributes in reverse video.
Addtnl Options	Displays a text file.
Do	Implements all the selected changes on the directory.
Cancel	Cancels the change for the file that the cursor is currently positioned on.
Exit	Cancels all selected changes and returns to the operating system if pressed before the Do key; returns to the directory if displaying a file; returns to the operating system prompt.
Ctrl/C	Cancels all selected changes and returns to the operating system prompt.
Find	Moves the cursor to the first character of the first file entry at the upper left corner of the screen.
Help	Displays a list of MAINT keys and functions.
Select	Moves the cursor horizontally to the first character of the previous file entry (the opposite function of the TAB key).

You can move the cursor with the keys listed in Table 6 only to the positions within a file entry that can be changed. For example, you cannot change the size of a file, so MAINT does not allow you to move the cursor to the file size. MAINT jumps over those positions within the file entry. MAINT does not allow you to move the cursor on the following characters within the file entry:

- The "R" in the "RW" or "RO" attribute. (You can move the cursor to the "W" or "O" because they are the only characters that change.)
- The second two characters of the "Dir" or "Sys" attribute. (When you type the first character of the new attribute, either "D" or "S", MAINT changes the remaining two characters of the attribute accordingly.)
- The file size.

Renaming a File Name or File Type. To rename a file name or file type, follow the instructions below.

1. Move the cursor to the first character of the file name or file type (or to the characters that are changing) using the directional arrow, Tab, Select, Find, or Return keys.
2. Type the new file name over the old file name.

> **NOTE**
> The characters you type are displayed on the screen in the same case as the characters that you are typing over regardless of whether you are using the Shift or Lock keys.

- You must follow the file naming conventions for files (see the section titled "Naming Files" earlier in this chapter). MAINT ignores any illegal characters as part of the file name or file type, such as a comma, and does not display them on the screen.
- When you type the first character of the new file name or file type, MAINT displays the file entry in boldface characters. This serves as a reminder that you have selected this file for a name change.

- If the new file name has fewer characters than the old file name, press the space bar to delete the remaining unwanted characters of the old file name. MAINT ignores any more than eight characters.

3. Now, you can either change the name or cancel the name change.

   - If you decide to keep the old file name, move the cursor to any character within the file entry and press the Cancel key. MAINT redisplays the old file name and returns the file entry to its original state.
   - If you decide to change the name, press the Do key. After you press the Do key, MAINT erases the screen and then redisplays the directory with the new file name or file type. The new file name is displayed in the directory according to where it falls alphabetically.

Changing a File Attribute. To change a file attribute (RO, RW, Dir, Sys), follow the instructions below. You can only change one attribute at a time.

1. Move the cursor to the "O", "W", "D", or "S" by using the directional arrow, Tab, Select, Find, or Return keys.
2. Type the new attribute over the old attribute.

   - MAINT only accepts the characters "W" and "O" for the RW or RO Attributes and "D" and "S" for the Dir and Sys Attributes. MAINT ignores any other characters. To change the RW or RO Attribute, move the cursor to the "W" or "O" and type the change.

     To change the Dir or Sys attribute, move the cursor to the "D" or "S" and type the change. When you type the "D" or "S", MAINT changes the remaining two characters of the attribute accordingly.
   - When you type the first character of the new attribute, MAINT displays the file entry in boldface characters to remind you that the file is selected for an attribute change.

3. Now, you can either change the attribute or cancel the attribute change.

   - If you decide to keep the old attribute, move the cursor to any character within the file entry and press the Cancel key. MAINT redisplays the old attribute and returns the file entry to its original state.
   - If you decide to change the attribute, press the Do key. After you press the Do key, MAINT erases the screen and then redisplays the directory with the new attribute.

Erasing a File. To erase a file, follow the instructions below.

1. Move the cursor to any character of the file entry using the directional arrow, Select, Find, Tab, or Return keys.
2. Press the Remove key. When you press the Remove key, MAINT displays the file entry within a reverse video block to remind you that the file is selected for deletion.
3. Now, you can either delete the file or keep the file.

   - If you decide to keep the file, move the cursor to any character within the file entry and press the Cancel key. MAINT returns the file entry to its original state.
   - If you decide to delete the file, press the Do key. After you press the Do key, MAINT erases the screen and then redisplays the directory without the file name.
   - If you erase all files from a directory page, MAINT displays the previous directory if one existed.

Displaying a File. To display the contents of a text file, follow the instructions below. Do not use MAINT to display nontext files such as those with file types .COM, .CMD, or .SYS. If you accidentally display a nontext file, the screen can become garbled, and the computer can stop. If this happens, reset the computer by pressing the Set-Up key, and followed by the Ctrl/Set-Up keys.

1. Move the cursor to any character of the file entry by using the directional arrow, Select, Find, Tab, or Return keys.
2. Press the Addtnl Options key.

   When you press the Addtnl Options key, MAINT erases the directory from the screen and then displays a one-line header in reverse video block at the top of the screen. The header lists the drive name, file specification, and user number. MAINT also displays the following line at the bottom of each screen:

```
Press "Exit" for directory, "Next Screen" to continue.
```

   MAINT displays these top and bottom lines on each page of the file.

   When you then press the Exit key, you are returned to the current directory display.

   When you press the Next Screen key, MAINT displays the next page of the file if there is one. If the last page of the file is already displayed, when you press the Next Screen key, MAINT displays the current directory.

> **NOTE**
> While you are using MAINT to display a file, you cannot use the Prev Screen key.

   When you type Ctrl/C, you are returned to the operating system prompt.

> **NOTE**
> The file cannot be changed while it is displayed. MAINT ignores any keys that you press while the file is displayed on the screen.

Correcting Mistakes. You can change your mind or correct mistakes as long as you have not pressed the Do key. To do this, press the:

- Cancel key: This key causes MAINT to cancel the change on the file entry where the cursor is currently positioned. MAINT returns the entry to its original state, that is, without the boldface characters or reverse video block. Other selected changes are unaffected. MAINT continues to display the directory on the screen, and you are free to make additional changes or press the Do key to implement the other changes.
- Exit key: This key causes MAINT to cancel *all* changes that you have selected and returns you to the operating system prompt.
- Ctrl/C : This combination of keys causes MAINT to cancel *all* changes that you have selected and returns you to the operating system prompt.

For a list of MAINT keys and their functions, press the Help key. To return to the current directory, press any key.

Exiting MAINT. To exit MAINT while viewing the directory, you can:

- Press the Exit key.
- Type:

  Ctrl/C

You are then returned to the operating system prompt.

Examples

The following examples assume drive A is the active drive.

1. Display the first page of the directory of all the files having the Directory and the System Attributes.

   A>MAINT Return

2. Display the contents of MEMO.TXT.

   - Move the cursor by using the directional arrow, Tab, Select, Find, or Return keys to any character of the MEMO.TXT file entry. (The cursor can be on any character including a blank space.)
   - Press:

     Addtnl Options

   - MAINT erases the screen and displays the first screen of MEMO.TXT.
   - To view the next screen of the file, press the Next Screen key. (Pressing the Next Screen key on the last page of file causes MAINT to return to the directory.)
   - To return to the directory at any time, press the Exit key.

3. Rename MEMO.TXT to LETTER.TXT.

   - Move the cursor to the first character in the file name, in this case, M.
   - Type:

     L

   - As soon as you type the first new character (L), MAINT displays the entry in boldface characters.
   - Type the remaining characters:

     ETTER

     NOTE
     Remember, if you decide not to change the old file name before pressing the Do key, move the cursor to any character within the file entry. Then, press the Cancel key. MAINT redisplays the old file name and returns the file entry to its original state.

- This example changes the file name. Press:

  Do

- MAINT changes the name and alphabetically lists the new name, LETTER.TXT, in the directory.

4. Change the RW (Read Write) Attribute of the file LETTER.TXT to the RO (Read Only) Attribute.

   - Move the cursor to the W in RW.
   - Type:

     O

   - As soon as you type O, MAINT displays the file entry in boldface characters.

     NOTE
     Remember, if you decide not to change the old attribute before pressing the Do key, move the cursor to any character within the file entry. Then, press the Cancel key. MAINT redisplays the old attribute and returns the file entry to its original state.

   - This example changes the attribute. Press:

     Do

   - MAINT changes the attribute and lists the new attribute, RO, in the attribute column of the directory.

5. Erase the file TEST.TXT.

   - Move the cursor to any character within the TEST.TXT file entry. The file must have the RW attribute. The cursor can be on any character including a blank space.
   - Press:

     Remove

   - As soon as you press the Remove key, MAINT displays the file entry within a reverse video block.

     NOTE
     Remember, if you decide not to erase the file before pressing the Do key, move the cursor to any character within the file entry. Then, press the Cancel key. MAINT returns the file entry to its original state.

   - This example erases the file. Press:

     Do

   - MAINT makes the change and lists the new directory without the file, TEST.TXT.

Remember that all of the changes shown in the examples above can be made by:

- Moving the cursor from file to file
- Marking the change in each file
- Pressing the Do key to implement all the changes

MDRIVE

Purpose

MDRIVE is a transient command that informs the CP/M-86/80 operating system that you wish to install or remove the memory drive.

The memory drive is a virtual disk drive. The CP/M-86/80 operating system uses the memory, which you allocate, as though it were a diskette drive. Any CP/M-86/80 operating system commands that reference or use a diskette drive are valid for the memory drive.

Because a memory drive does not depend on the mechanical rotation of a diskette, the reading and writing operations on a memory drive are much faster than on a diskette drive.

Form

MDRIVE [n] Return

Instructions

MDRIVE allows you to allocate memory in 64K byte blocks.

The first 128K bytes of memory are reserved for the CP/M-86/80 operating system and application programs. To use the MDRIVE command successfully, you must have at least 192K bytes of memory.

Examples

The MDRIVE examples assume that a total of 330K bytes of memory are available. The 330K byte total includes the 128K bytes from the system unit and a 192K byte memory option.

1. When you do not know how much memory you can allocate, type:

```
A>MDRIVE Return
```

The program responds with:

```
The M: Drive consists of 1 or more 64k blocks which are
allocated from available system memory.

There are 3 64k blocks available

Type in the number of blocks desired followed by return.
(1--3):
```

You respond with a number, for example:

```
2 Return
```

The program confirms that:

```
M: drive installed. Available file space =  126k

A>
```

2. You can also specify the number of blocks on the same line as the MDRIVE command. The following example allocates the same amount of memory as the previous example:

```
A>MDRIVE 2 Return
```

The program responds with:

```
M: drive installed. Available file space =  126k

A>
```

NOTE
MDRIVE reports an available file space that is always slightly less than the amount you specified. The operating system uses the extra space to store the memory drive files directory.

3. The name of the memory drive is M. You can make drive M the default drive by typing:

```
A>M: Return
```

   After drive M is installed, it is blank. It does not contain any files. If you wish to run an application program from drive M, you must use the PIP command to copy the program to drive M.

4. You can remove the M drive by specifying zero 64K blocks as in the following example:

```
M>A: Return
A>MDRIVE 0 Return
```

   The program responds with:

```
M: drive removed.


A>
```

5. If you do not remember that you have already installed the memory drive, the following dialog takes place:

```
A>MDRIVE Return

M: Drive already configured on this system
Do you wish to remove it (Y or N):
```

NOTE
Do not attempt to remove drive M when it is the active drive.

If you have saved any new or modified data on drive M, use the PIP command to copy the data onto a diskette before removing the M drive. When you remove the M drive or turn the Rainbow computer off, any data on drive M is lost.

WARNING
Some application programs require more than 128K bytes. If you intend to run an application that requires more than 128K bytes, then you must allow more memory for the application by allocating less memory for the memory drive.

PIP

Purpose

PIP (Peripheral Interchange Program) is a transient command that transfers files from one device to another, such as from a diskette to a printer.

For example, you can use PIP to:

- Copy file(s) from one diskette to another diskette
- Print file(s) on a printer
- Copy file(s) from one user number to another user number
- Combine two or more files into one file
- Rename a file after copying it

Do not use PIP to copy nontext files to a printer.

Forms

PIP has two modes:

1. **Command Mode**. Use this mode for simple copying that can be typed on one line. This mode has several forms shown on the next page. The symbol [p] represents an optional parameter that is an additional instruction for PIP. (Refer to Table 7, found later in this section, for a list of the PIP parameters.)

    - Make a copy of a file and give it a new file name:

    ```
    PIP [drv:]newname.typ=[drv:]oldname.typ[p] Return
    ```

    NOTE
    Unlike other options shown in brackets, [ ], when you use a PIP parameter, [p], you must include the brackets with the parameter.

- Copy an existing file to a new file, but keep the old file name:

```
PIP drv:=[drv:]oldname.typ[p] Return
```

- Create a new file by combining two existing files:

```
PIP [drv:]newname.typ=[drv:]oldname1.typ[p],
    [drv:]oldname2.typ[p] Return
```

NOTE
If you specify a drive for oldname1, you must also specify the drive for oldname2.

- Copy data from a device to a file:

```
PIP [drv:]name.typ=dev:[p] Return
```

- Copy a file to a device:

```
PIP dev:=[drv:]name.typ[p] Return
```

- Copy data from one device to another:

```
PIP dev1:=dev2:[p] Return
```

The form of the PIP command you will probably use most often is:

```
PIP drv:=[drv:]oldname.typ[p] Return
```

2. **Program Mode**. Use this mode for more complex copying that requires more than one command to copy all the needed files. Program mode eliminates the need to type PIP with each command. To enter program mode, type:

   ```
   PIP (Return)
   ```

   PIP displays its prompt:

   ```
   CP/M-86 PIP VERSION 1.1

   *
   ```

   The forms of the PIP command in program mode are identical to those in command mode. However, in program mode, you do not type the command "PIP" on each line.

   Pressing the Return key or typing Ctrl/C next to the PIP prompt, *, returns you to the operating system prompt.

Instructions

For most forms of the PIP command, type the command followed by:

1. The new file specification, which includes the device, file name, and file type. The new file specification is also referred to as the destination file specification (where data is copied to). You type this information on the left side of the equal sign.
2. An equal sign.
3. The old file specification, which includes the device, file name, and file type. The old file specification is also referred to as the source file specification (where the data is copied from). You type this information on the right side of the equal sign.

   If you omit the device, PIP assumes the active drive. PIP accepts wildcards in file names and file types.

4. Any optional parameters. When using parameters, follow the instructions below:

   - Type parameters at the end of the command line inside square brackets, [ ].
   - Do not include a blank space between the file specification and the opening bracket.
   - If desired, insert more than one parameter within the same square bracket.
   - Do not include a blank space between a parameter and its numeric value.
   - End parameters requiring a character sequence by typing Ctrl/Z.

     PIP ignores any invalid parameter(s) you type within the square brackets; the command is executed as though the invalid parameter(s) did not exist.

Optional Parameters. Table 7 lists the optional PIP parameters and their effects. PIP parameters are single characters (or single characters followed by numbers or characters that supply information for the parameter to act on). In Table 7, "n" represents a numeric value and "s" represents a character sequence you supply in the command line. Tell PIP you are finished typing the sequence by typing Ctrl/Z. More than one parameter can be used in the same command line in the form:

```
[ppp...]
```

Table 7. PIP Optional Parameters

Parameter	Effect
Dn	Deletes characters that extend past column n (counted from the last Return or line feed).
E	Echos (displays) all copying operations on the screen as they occur.
F	Removes form feeds (page breaks) from the original file.
Gn	Copies a file to or from a user number other than the currently active user number. This is the only parameter allowed to follow the destination file specification. When using G, you must specify the full file specification including the drive name.
H	Transfers Intel hexadecimal data.
I	Ignores null records (records that begin with :00) in the transfer of Intel hexadecimal file format. Automatically sets the H option.
L	Converts uppercase characters to lowercase characters. This option works with ASCII characters only.
N	Adds line numbers to each line of the destination file.
O	Transfers nontext files.
Pn	Inserts a page break after each n lines.
Qs ^Z	Copies from the first character (or where the S option is used) of the source file including the string you specified in s. Program mode must be used if lowercase characters are to be matched. Can be used with the S"option to extract a portion of a file. You can only specify one string.
R	Copies files having the System Attribute.
Ss ^Z	Copies from the string you specified in s of the source file to the end of the file (or where the Q option is used). Program mode must be used if lowercase characters are to be matched. Can be used with the Q option to extract a portion of a file. You can only specify one string.
Tn	Sets tabs at every nth column.
U	Converts lowercase characters to uppercase characters. This option works with ASCII characters only.
V	Verifies that data has been copied correctly.

Table 7. PIP Optional Parameters (cont.)

Parameter	Effect
W	Writes over files with the Read Only Attribute.
Z	Sets the parity bit to 0. When transferring ASCII files, use this option to set the eighth bit (bit 7) of each character to zero. Do *not* use this option with files containing non-English language characters.

Checking For Free Space. Before using PIP, you should use the MAINT or STAT commands to check that the destination device has enough free space so the file can be copied. Check the space even if the file you are copying overwrites an existing file. If there is not enough free space on the destination device, PIP displays the following message:

```
ERROR: DISKETTE WRITE - [drv:]filename.typ
```

Avoiding Accidental Deletion. Use PIP with caution when copying files having identical file names and file types (but containing different data) between devices. Because PIP deletes the old file after copying the new file, you can accidentally delete a file if the files have the same name and type.

For example, suppose you want to copy the file that contains survey results (SURVEY.TXT) from the diskette in drive A to the diskette in drive B. However, a file that contains survey questions (SURVEY.TXT) already exists on the diskette in drive B.

When you copy SURVEY.TXT from the drive A diskette to the drive B diskette, PIP deletes the original SURVEY.TXT (containing the survey questions) from the drive B diskette. You now have two copies of the file containing survey results. Refer to Figures 7 and 8.

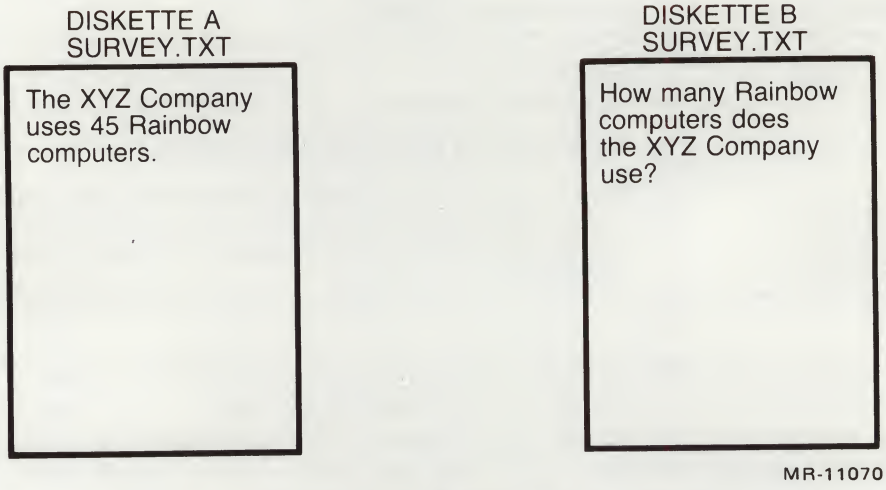


Figure 7. Status of Diskettes Before PIP

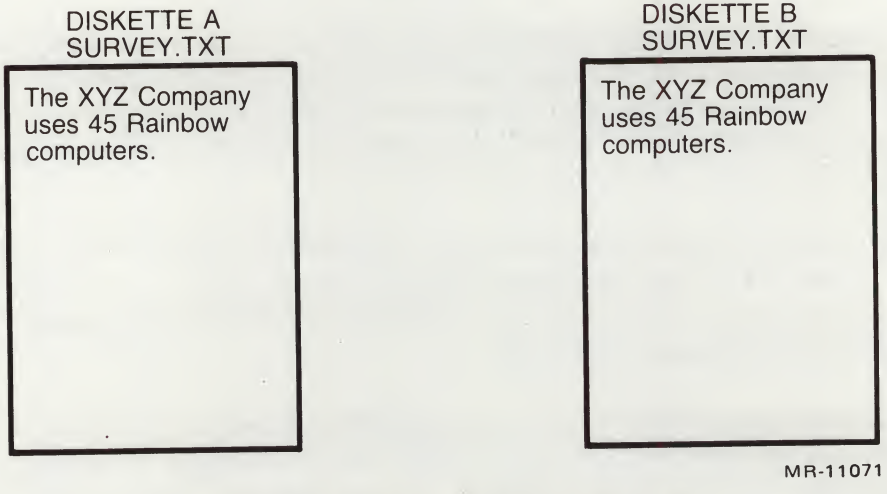


Figure 8. Status of Diskettes After PIP

To avoid accidental deletion of files, give each file a different file name and file type.

Examples

The following examples assume drive A is the active drive. If you omit the drive name, PIP assumes the active drive. However, you may include the active drive name if desired.

For example, you can make a copy of the existing file, TEST.TXT on diskette A with a new name, NEW.TXT on diskette A using any of the following forms:

```
A>PIP A:NEW.TXT=A:TEST.TXT Return

A>PIP A:NEW.TXT=TEST.TXT Return

A>PIP NEW.TXT=A:TEST.TXT Return

A>PIP NEW.TXT=TEST.TXT Return
```

You now have two copies of the same file, but the files have different file names.

The following examples omit the active drive name.

1. Copy the existing file TEST.TXT on the diskette in drive A to the file EXAM.TXT on the diskette in drive B:

   ```
   A>PIP B:EXAM.TXT=TEST.TXT Return
   ```

   This form is considered the long form because you type file names and file types for the destination and source file specifications.

2. Copy the existing file TRANSFER.SUB on the diskette in drive A to the same file name on the diskette in drive B:

```
A>PIP B:=TRANSFER.SUB Return
```

This form is considered the short form because you type only a device for either the source or destination file specifications. PIP replaces the omitted file name and file type with the file name and file type specified in the source file specification. You cannot use this form to copy a file from a drive and user number to the same drive and user number.

3. Copy the existing file NAMES.DOC on the diskette in drive A, user number 0, to the same diskette, user number 2:

```
A>PIP A:[G2]=NAMES.DOC Return
```

When using the [Gn] option, you must type the drive name in the destination file specification. Remember that the [Gn] option is the only option allowed as part of the destination file specification.

4. Copy all files with the file type .TXT on the diskette in drive A to the diskette in drive B using a wildcard:

```
A>PIP B:=*.TXT Return
```

When you copy multiple files, PIP displays the file name of each successfully copied file.

> **NOTE**
> You can use wildcards only with the source file specification.

5. Create a new file, NEWFILE.TXT on the diskette in drive B from two existing files (OLDFILE1.TXT and OLDFILE2.TXT) on the diskette in drive A:

```
A>PIP B:NEWFILE.TXT=OLDFILE1.TXT,OLDFILE2.TXT Return
```

Separate the existing files with commas; you can enter blank spaces between the comma and the next file name. You can use parameters for each source file specification. The file NEWFILE.TXT contains the two existing files, OLDFILE1.TXT and OLDFILE2.TXT.

6. Extract a portion of the existing file WORDS.TXT on the diskette in drive A and copy it to the file LETTERS.TXT on the diskette in drive B. Begin extracting text with the word "NOW" and end with the word "LETTER":

```
A>PIP B:LETTERS.TXT=WORDS.TXT[SNOW^Z QLETTER^Z] Return
```

The words "NOW" and "LETTER" are included in the extracted portion of the file. If you want to match lowercase characters, use program mode.

7. Print the file REPORT.TXT on the printer:

```
A>PIP PRN:=REPORT.TXT Return
```

PRN: is a symbol used by PIP to output data to the printer device (LST:) in a special format that:

- Numbers lines
- Expands tabs
- Paginates after 60 lines unless you use the [Pn] option

The following command also prints the file on the printer, but does not number lines, expand tabs, or paginate:

```
A>PIP LST:=REPORT.TXT Return
```

NOTE
Refer to the *Rainbow Installation Guide* if you want to attach a printer to the computer.

8. Using program mode, create a new file NEWFILE.TXT on the diskette in drive A from the existing files OLDFILE1.TXT and OLDFILE2.TXT on the diskette in drive A. Then, copy the existing file NEWFILE.TXT on diskette A to diskette B:

```
A>PIP Return
CP/M-86 PIP VERSION 1.1
*NEWFILE=OLDFILE1.TXT,OLDFILE2.TXT Return
*B:=NEWFILE.TXT Return
* Return
```

The asterisk (*) indicates that PIP is ready to accept commands. Do not type the command PIP while using program mode. To exit PIP program mode, press the Return key or type Ctrl/C next to the PIP prompt, *.

RED

Purpose

RED is a transient command that calls in the Rainbow editor. You can use RED to create new files or make changes to existing files.

Form

RED [drv:]filename.typ Return

Instructions

Be sure the diskette is not write-protected. Type the command followed by the optional drive name, the file name, and the file type. If you omit the drive name, RED assumes the active drive. When you type the command, RED responds with:

```
Loading RAINBOW EDITOR Version 1.1
```

Examples

The following examples assume drive A is the active drive.

1. Create the file MEMO.TXT:

   ```
   A>RED MEMO.TXT Return
   ```

2. Create the file LETTER.DOC on drive B:

   ```
   A>RED B:LETTER.DOC Return
   ```

> **NOTE**
> For a complete description of RED, refer to Chapter 3 of this guide.

REN

Purpose

REN (rename) is a built-in command that changes the name of a file on a diskette to a new name on the same diskette. After you rename a file, the operating system no longer recognizes the file by its old file name.

Form

REN [drv:]newname.typ=[drv:]oldname.typ Return

Instructions

Type the command followed by:

1. Optional drive name
2. New file name and file type
3. Equal sign
4. Optional drive name
5. Old file name and file type

Any time you do not specify the drive name, the file is assumed to be on the active drive.

You must type the old file name exactly as it is displayed in the directory. If you omit the drive name, REN assumes the active drive and does *not* accept wildcards in the file name or file type. If you include drive names for both files, the drive names must be the same. Verify the name change by using DIR.

Examples

The following examples assume drive A is the active drive.

1. Rename the old file ORIGINAL.TXT to the new file REVISED.TXT:

   ```
   A>REN REVISED.TXT=ORIGINAL.TXT Return
   ```

2. Rename the old file ORIGINAL.TXT (on the diskette in drive B) to the new file REVISED.TXT (on the diskette in drive B):

   ```
   A>REN B:REVISED.TXT=ORIGINAL.TXT Return
   ```

STAT

Purpose

STAT (status) is a transient command that displays information about files and devices. It also allows you to have certain controls over the files and devices.

Different forms of the STAT command let you:

- Display the status of a drive
- Display free space on a diskette(s)
- Display file size
- Display and change the attributes of a file
- Display STAT commands and device names
- Display and set physical-to-logical device assignments
- Display diskette characteristics
- Assign a temporary Read Only Attribute to a drive

The following discussion about the STAT command is divided into two parts:

- How to use STAT with files
- How to use STAT with devices

Status of Files

STAT provides the following levels of information about files and the diskettes they are stored on:

STAT [drv:]	Displays the amount of free space remaining on a diskette and the drive's attribute.

STAT filespec

Displays the following information:

Drive: indicates the drive the file is stored on.

User: indicates the user number and the files stored under the current user number.

Recs: indicates the number of records used by each file (each record is 128 bytes).

Bytes: indicates the number of kilobytes used by each file.

FCBs: indicates the number of File Control Blocks used by each file; a file control block contains the information necessary for the operating system to access the file, such as the file name, file type, file size.

Attributes: indicates the attributes of the file; RO (Read Only) or RW (Read Write) and Dir (Directory) or Sys (System) are displayed under this heading.

Name: indicates the name of the file.

When you type a command that causes more than one file to be displayed, STAT lists the files alphabetically.

Forms

- Display the attributes and amount of free space (in bytes) on the diskettes in *all* drives accessed since the last operating system start-up:

  `STAT` Return

- Display the amount of free space (in bytes) on a specified diskette:

  `STAT drv:` Return

- Display the size (in records and bytes), file control blocks, and attributes of a single file or group of files:

  `STAT [drv:]filename.typ` Return

- Assign an attribute to a single file or a group of files:

```
STAT [drv:]filename.typ atr (Return)
              or
STAT [drv:]filename.typ $atr (Return)
              or
STAT [drv:]filename.typ [atr] (Return)
              or
STAT [drv:]filename.typ=[atr] (Return)
```

Instructions

Type the command followed by the optional drive name, file name, file type, and any optional attributes. If you omit the drive name, STAT assumes the active drive. STAT accepts wildcards.

When assigning attributes to files, separate the file specification from the attribute with a blank space, a comma, or an equal sign (=) known as a "separator." If desired, you can precede the attribute with a dollar sign ($) or enclose the attribute in square brackets ([ ]). Attributes are RO, RW, Sys, and Dir.

Examples

The responses for the following examples may not be displayed exactly as shown in these examples, because your diskette probably contains different files. For example, the free space remaining on your diskette will probably be different from the values in the examples shown. The examples assume that drive A is the active drive:

1. Display the attributes and amount of free space on the diskettes in drive A and drive B, both of which have been accessed since the last operating system start-up.

```
A>STAT (Return)

A: RW, Free Space:       180k
B: RW, Free Space:       176k
```

2. Display the attributes, file control blocks, and amount of space occupied by the file SHOW.SUB on the diskette in drive B:

```
A>STAT B:SHOW.SUB Return
      Drive B:                              User :  0
      Recs  Bytes FCBs Attributes           Name
         1     2k     1 Dir RW             B:SHOW    .SUB
     ------------------------------------------------
     Total:     2k     1
     B: RW, Free Space:        230k
```

3. Display the attributes, file control blocks, and amount of space occupied by each file with the file type .TXT:

```
A>STAT *.TXT Return
      Drive A:                              User :  0
      Recs  Bytes FCBs Attributes           Name
         1     2k     1 Dir RW             A:DOCU    .TXT
         1     2k     1 Dir RW             A:SHOW    .TXT
     ------------------------------------------------
     Total:     4k     2
     A: RW, Free Space:        230k
```

4. Assign the System Attribute to the file TEST.TXT:

```
A>STAT TEST.TXT SYS Return
A: TEST    .TXT set to System (Sys)
```

5. Assign the Read Only Attribute to the file SHOW.SUB:

```
A>STAT SHOW.SUB RO Return
A: SHOW    .SUB set to Read Only (RO)
```

Status of Devices

The computer routinely communicates with the following devices:

- Video display device: the screen
- Keyboard
- Drives

In addition, the computer can communicate with other devices that you connect to it, such as:

- Printers
- Modems (a device used to communicate with a computer over phone lines)
- Other computers

The operating system needs to know which devices are connected to the computer so the computer can operate properly. You tell the operating system which devices are connected to the computer when you assign logical names to physical devices, such as a printer.

Logical names are used because any one of several "physical" devices can be connected to the computer to accomplish one function. For example, the logical name CON: (console) represents your console input/output device whether it is a CRT: (video terminal) or a TTY: (teletype).

Logical names are assigned to physical devices through the STAT command.

Standard assignments are made before you receive the computer. You should not have to change these unless you want to make different assignments.

Table 8 lists logical names and their generic representations.

Table 8. Rainbow Computer's Logical Name Assignments

Logical Name	Function
CON:	This is the user console device. It interacts with the operating system, accepts input from a keyboard and displays output on either a video screen or on paper.
AXI:	This device receives information (input only).
AXO:	This device sends information (output only).
LST:	This device lists information (output only), on a printer, for example.

STAT associates these logical names with one of several standardized physical device names. Table 9 lists the meanings of these physical device names for the computer. The term port in Table 9 refers to an input or output connection to the computer. You can assign any one of the physical devices to each logical device.

Table 9. Rainbow Computer's Physical Name Assignments

Physical Device Name	Physical Device
TTY:	The printer port that allows input and output
CRT:	A video terminal (the video screen and keyboard)
BAT:	The communications port, input and output
UC1:	The optional communications port
PTR:	The communications port, input only
PTP:	The communications port, output only
UR1:	The optional communications port
UR2:	A null device
UP1:	The optional communications port
UP2:	A null device
LPT:	The communications port, input and output
UL1:	The optional communications port

NOTE
The console is set up to be the keyboard/monitor; the commport to be the I/O device; and the printer port to be the listing device.

Forms

1. Display the current physical-to-logical device assignments:

   ```
   STAT DEV: Return
   ```

2. Display the possible physical-to-logical device assignments and a partial STAT command summary:

   ```
   STAT VAL: Return
   ```

3. Assign a physical device (phydev:) to a logical device (logdev:):

   ```
   STAT logdev:=phydev: Return
   ```

4. Display diskette storage characteristics:

   ```
   STAT [drv:]DSK: Return
   ```

   This form of STAT displays useful information for advanced users of the CP/M-86/80 operating system.

5. Assign a temporary Read Only Attribute to a drive:

   ```
   STAT drv:=RO Return
   ```

   You can set the drive back to the Read Write Attribute by using the STAT command, typing Ctrl/C, or turning the computer off. The operating system sets drives to the Read Write Attribute by default.

6. Display the current user number and all user numbers that contain files:

   ```
   STAT USR: Return
   ```

Instructions

Type the command followed by any desired parameters. If you omit the drive name, STAT assumes the active drive.

Examples

1. Display the current physical-to-logical assignments:

```
A>STAT DEV: Return
CON: is CRT:
AXI: is PTR:
AXO: is PTP:
LST: is TTY:
```

2. Display a partial STAT command summary and the valid physical-to-logical device assignments:

```
A>STAT VAL: Return
STAT 2.2
Read Only diskette: d:=RO
Set Attribute: d:filename.typ [ro] [rw] [sys] or [dir]
diskette Status   : DSK: d:DSK:
User Status   : USR: d:USR:
Iobyte Assign:
CON: = TTY: CRT: BAT: UC1:
AXI: = TTY: PTR: UR1: UR2:
AXO: = TTY: PTP: UP1: UP2:
LST: = TTY: CRT: LPT: UL1:
```

3. Assign the logical name CON: to the physical device CRT:

```
A>STAT CON:=CRT: Return
```

4. Display the characteristics for the diskette in drive A:

```
A>STAT A:DSK: Return
          A: Drive Characteristics
      3,120: 128 Byte Record Capacity
        390: Kilobyte Drive  Capacity
        128: 32 Byte  Directory Entries
        128: Checked Directory Entries
        256: 128 Byte Records / Directory Entry
         16: 128 Byte Records / Block
         40: 128 Byte Records / Track
          2: Reserved  Tracks
```

5. Set drive B temporarily to the Read Only Attribute:

```
A>STAT B:=RO Return
```

NOTE
Using STAT to write-protect a diskette is probably not advisable because such protection is retained only in the computer and is nullified when you type Ctrl/C or turn the computer off.

6. Display the active user and all user numbers that contain files:

```
A>STAT USR: Return
A: Active User :  0
A: Active Files:  0
```

NOTE
Refer to the discussion of the USER command to change user numbers.

SUBMIT

Purpose

SUBMIT is a transient command that runs a group of previously generated CP/M-86/80 commands from a file you create. Use SUBMIT if you:

- Type the same series of commands repeatedly
- Want to run complex tasks by using one command

Forms

```
SUBMIT filename (Return)
SUBMIT filename parameters (Return)
```

The first form runs command files containing complete commands. The second form runs command files that require input from the keyboard.

Instructions

Create a command file with the file type .SUB using a text editor such as RED (refer to Chapter 3 of this guide). Type the commands, each on a separate line, in the order you want them to be executed. (The .SUB file is sometimes referred to as a command file because it contains commands.) Then type the SUBMIT command followed by the file name containing the commands you want executed. You do not need to specify .SUB with the file name. SUBMIT automatically looks for that file type.

When run, SUBMIT searches for the specified file name with the file type .SUB and creates a copy of this file named $$$.SUB on the diskette that is in the drive you started the operating system from. Because SUBMIT creates a file on this diskette:

- It *cannot* have a write-protect tab on its write-protect notch.
- Free space must exist on the diskette.

The file, $$$.SUB, is a copy of the original file. The operating system sequentially executes each command you typed in that file. The operating system deletes each command line in $$$.SUB as it is executed and deletes the entire file when all the commands are executed.

You can stop the SUBMIT program by pressing any key. When you do this, the operating system completes the current command before it stops the SUBMIT program. Because the program did not complete, the file still resides on the diskette. If you do not delete this file from the diskette before you reset or turn the computer off, the SUBMIT program attempts to continue with the commands remaining in the $$$.SUB file the next time you start the computer.

Using Incomplete Commands

If you want to specify different files, drives, or devices each time you run a .SUB file, create a file with incomplete commands. Mark the missing pieces of information with a dollar sign ($) followed by a number from one to nine, inclusive. SUBMIT allows nine such "place holders" in each .SUB file. The combination of these two characters serves as a place holder until you run SUBMIT and supply the information in the command tail. Use two dollar signs ($$) if you want to include a literal dollar sign in the .SUB file.

Type the specific parameters at the end of the command when running SUBMIT. Type a blank space between each parameter.

When SUBMIT runs the command file, all occurrences of $1 in the .SUB file are replaced with the first parameter found in the command tail. All occurrences of $2 are replaced with the second parameter found in the command tail. The same procedure occurs for each place holder.

SUBMIT ignores parameters supplied in the command tail that exceed the number of place holders in the .SUB file. If you do not supply enough parameters, SUBMIT removes the place holders from the .SUB file and executes the command without the information. This usually results in a problem.

You cannot nest SUBMIT commands within .SUB files. However, you can cause another .SUB file to execute from the previous .SUB file. Do this by including a SUBMIT command as the last line in the file; this "links" one .SUB file to another .SUB file. In Figure 9 the file XXX.SUB is linked to the file YYY.SUB.

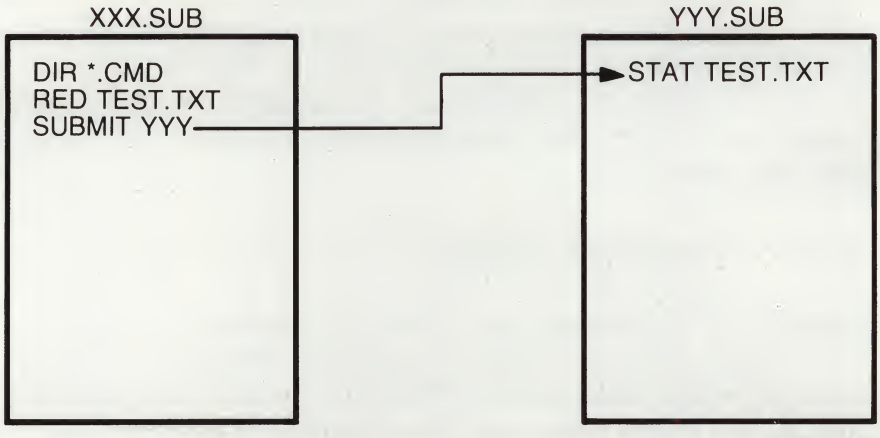


Figure 9. Linking Two .SUB Files

Wildcards can be used as part of the commands within a .SUB file.

Examples

The following examples assume drive A is the active drive.

1. Create a command file named SUBEX.SUB using the text editor, RED, containing the following complete commands:

```
STAT
RED TEST.TXT
TYPE TEST.TXT
STAT
```

   Next, type:

```
A>SUBMIT SUBEX (Return)
```

   When SUBMIT runs the commands in SUBEX.SUB:

   - STAT displays the amount of free space on the diskette in drive A.
   - The text editor, RED, creates a file named TEST.TXT.
   - You type the contents of the file and then return to the operating system.
   - TYPE displays the contents of TEXT.TXT after you exit the text editor.
   - STAT displays the amount of free space left on the drive A diskette.

2. Create a command file named TRANSFER.SUB containing the following incomplete commands:

```
PIP $2:=$1:$3.*
STAT $2:$3.*
```

   SUBMIT substitutes the information that you type in the command tail for the place holders $1, $2, and $3 in the file. The colons and asterisks are literal additions that SUBMIT appends to that information.

Next, type:

```
A>SUBMIT TRANSFER B A ACCOUNT Return
```

When SUBMIT runs the commands in TRANSFER.SUB:

- B is substituted for all occurrences of $1.
- A is substituted for all occurrences of $2.
- ACCOUNT is substituted for all occurrences of $3.
- B and A are separated by an equal sign (=).
- An asterisk (*), is appended to ACCOUNT.

The result of running TRANSFER.SUB is the same as typing the following commands:

```
A>PIP A:=B:ACCOUNT.* Return
A>STAT A:ACCOUNT.* Return
```

Include necessary separators, such as periods, colons, and wildcards, in your .SUB file so you do not have to type them on the SUBMIT command line. Sometimes, separators included in a command line result in a problem. The following example causes a problem because the period between "TEST" and "DOC" can be intrepreted as a parameter separator rather than as a character in a single parameter.

```
A>SUBMIT TASK TEST.DOC Return
```

TYPE

Purpose

TYPE is a built-in command that displays the contents of a text file on the screen. Text files contain only printable characters. You cannot use TYPE with file types .COM, .CMD or .SYS.

TYPE also displays files even if they:

- Have the Read Only Attribute
- Are stored on a diskette that has a write-protect tab on it
- Reside in a drive that has the Read Only Attribute

Form

TYPE [drv:]filename.typ Return

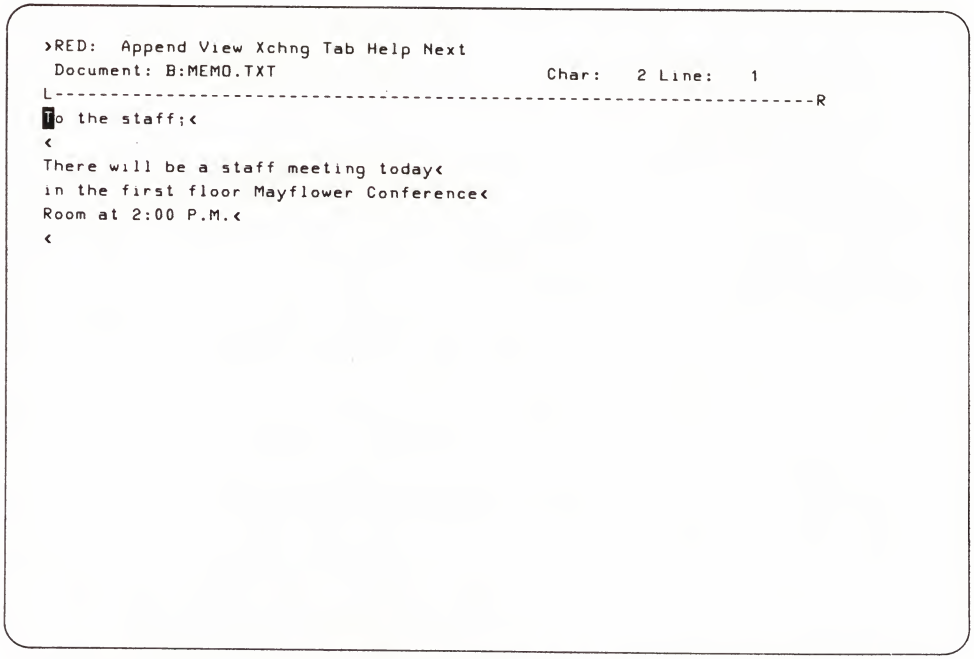
Instructions

Type the command followed by the optional drive name, the file name, and the file type. If you omit the drive name, TYPE assumes the active drive. TYPE does *not* accept wildcards in the file name and file type.

Press Hold Screen or type Ctrl/S to temporarily stop the text from scrolling; press Hold Screen or type Ctrl/S again to continue the display. Repeat this process to stop and start the display. Type Ctrl/C or any other key to stop the display and return to the operating system.

Do not use the TYPE command on files with nontext characters such as file types .COM, .CMD, or .SYS. If you accidentally TYPE a nontext file, the screen can become garbled and the computer can stop. If this happens, reset the computer by pressing the Set-Up key followed by the Ctrl/Set-Up keys.

However, if you insert a tab to indent the first line, RED counts the tab as one character and changes the character count to 2 as shown in Screen 21c.



Screen 21c. Inserting a Tab

Looking at a Document

The Display command (**D**), Next Screen Key and Prev Screen key are all useful when you have more than one screen (twenty-one lines) of text. These keys allow you to display a screen of text at a time, moving either forward or backward through the document.

Moving Forward and Backward

To move forward one screen, type:

```
D
```

or press the Next Screen key. To move backward one screen, type:

```
-D
```

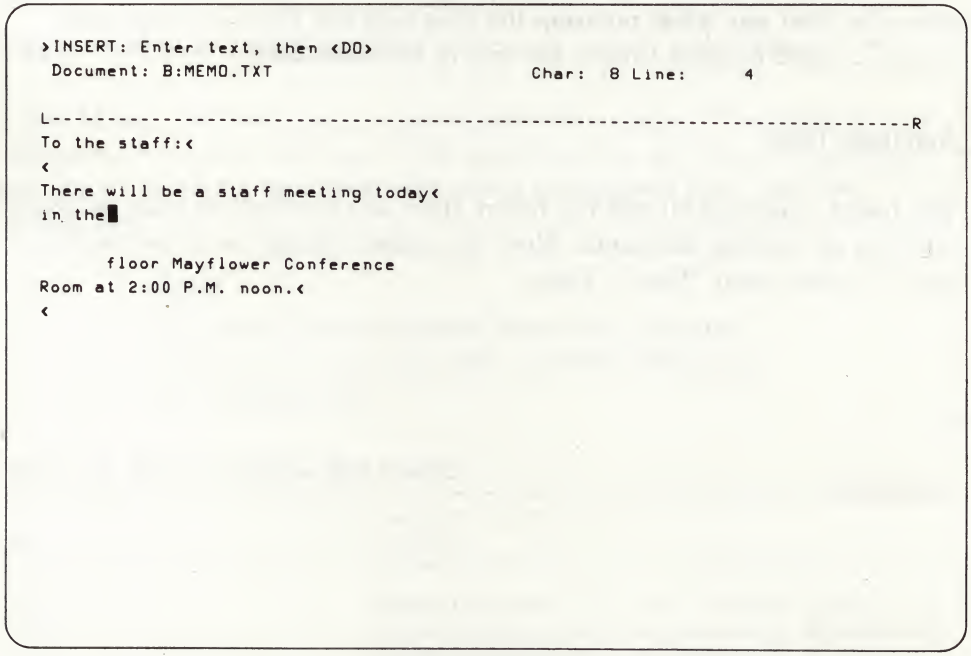
or press the Prev Screen key. If you want to skip several screens ahead or behind, type a number in front of the D (or Next Screen key), or the -D (or Prev Screen key). For example, 3-D causes RED to display the third screen *previous* to the current one. If you have only one screen, as you do with MEMO.TXT, and the cursor is at the top of the document, the following occurs:

1. Pressing D or the Next Screen key causes the text to disappear from view. You do not lose the text, however.
2. Pressing -D or the Prev Screen key redisplays the document and reverses the angle bracket, at the beginning of the command line, to <. This indicates the direction of the cursor. If the cursor is moving in a backward direction, the command line begins with "<RED:". If the cursor is moving in a forward direction, the command line begins with ">RED:".

If the cursor is at the bottom of MEMO.TXT, the following occurs:

1. Pressing D or the Next Screen key redisplays the document.
2. Pressing -D redisplays the document moving the cursor to the top and changing the angle bracket pointing left (<).
3. Pressing the Prev Screen key redisplays the document, and reverses the angle bracket, at the beginning of the command line, to >.

The existing text drops two lines to open a space for you to type additional text. The cursor position does not change and the new text is inserted before the cursor. (See Screen 22a.)



Screen 22a. Adding Text

Notice that the command line changes. RED instructs you to enter the text and press the Do key when finished. Type the text next to the cursor. *Remember to type a space after you have finished adding the text;* otherwise, two words will run together.

Type:

```
first (Do)
```

After you press the Do key, the text merges and RED redisplays the command line. (See Screen 22b.) RED positions the cursor on the "f" in the word "floor".

Screen 22b. Added Text

Erasing Text

The Erase command (**E**), or the Remove key, removes spaces, character(s), or lines from a document. For this example, move the cursor to the space before the word "today". Then, press:

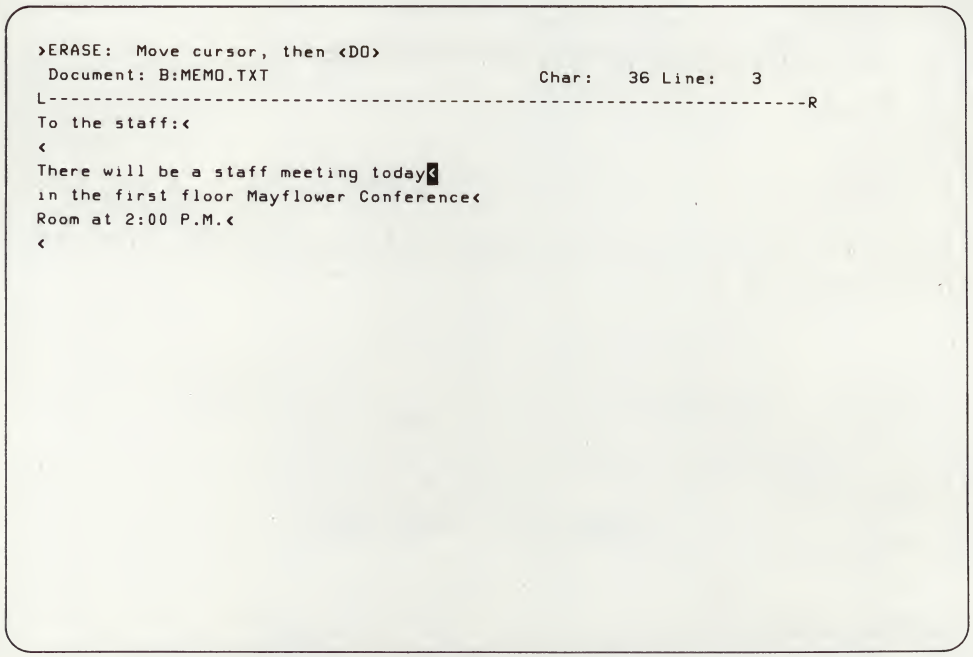
E

or

Remove

RED instructs you to move the cursor across the text you want to erase and press the Do key when finished.

Move the cursor to the carriage return symbol (<). When you move the cursor forward, text to be erased is displayed at half the intensity. This is known as "marking" a section of the document.



Screen 23a. Erasing Text

NOTE
If you change your mind or erase too far, reverse the cursor, using the left arrow key, over the character(s) you want to keep. Remember, only the characters shown in half-intensity will be erased.

Now press:

Do

RED erases the space and the word "today". It then redisplays the command line.

Now move the cursor to the space before the word "noon".

1. Press:

   E

2. Move the cursor to the carriage return symbol
3. Press:

   Do

RED erases the space, the word "noon", and the period. (See Screen 23b for the results of the entire procedure.)

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
 Document: B:MEMO.TXT                        Char:  18  Line:    5

L-------------------------------------------------------------------------------R
To the staff:<
<
There will be a staff meeting today<
in the first floor Mayflower Conference<
Room at 2:00 P.M.<
<
```

Screen 23b. Erased Text

Exchanging Characters

The Xchng command (**X**) exchanges or replaces characters or words, character-by-character. Move the cursor, using the arrow keys, to the "s" in the word "staff;" in the first line. Type:

```
X
```

In a new command line, RED instructs you to enter the new text and press the Do key when finished. This example changes the lowercase "s" in "staff" to uppercase, and changes the semicolon after "staff;" to a colon(:). Type:

```
Staff: (Do)
```

> **NOTE**
> You could also use the Xchng command twice to change the two characters individually. However, retyping the whole word reduces time and keystrokes.

As you type the new characters, the old characters are exchanged. After you press the Do key, RED redisplays the command line and saves the correction. RED places the cursor on the carriage return symbol (<) at the end of the line "To the Staff:".

Replacing Text

The Replace command (R) finds and replaces a word or character(s) each time it occurs in your document. Move the cursor to the beginning of your text and type:

```
R
```

In a new command line, Red instructs you to enter the old text and press the Return key when finished.

The number 10000 is displayed to the left of the word "REPLACE" on the screen. This number indicates that Replace will find and replace up to 10,000 occurrences (in other words, all occurrences) of the specified entry.

For this example, change 2:00 P.M. to 10:00 A.M. Tuesday. Type:

```
2:00 P.M. Return
```

NOTE
It is important, when entering the text you want to replace, to type the text *exactly* as it was typed in your document. This includes using uppercase and lowercase characters where appropriate. To replace a word like "the" which may be part of "other", do the following:

Type a space.

Type *the.*

Type another space.

This ensures that RED will search for "the" only when it is a separate word.

After you press the Return key, RED displays a new command line instructing you to enter the new text and press the Return key.

Type:

```
10:00 A.M. on Tuesday. Return
```

Ending Work with a Document

The Quit command (**Q**) ends your work on a document. Type:

```
Q
```

RED displays the options shown in Screen 26 asking whether you want to keep, abandon (not keep the version of the document you have just created or edited), or return to the document.

```
>QUIT: Keep Abandon <DO>
       Document: B:MEMO.TXT



       Keep       - this will save any changes made
                    since the last editing session.

       Abandon    - this will end editing WITHOUT
                    saving the changes made.

       <DO>       - go back to document
```

Screen 26. Quit Options

For this example, keep the text and all changes you have made. Type:

```
K
```

RED displays the following message on the screen:

```
Keeping
B:MEMO.TXT
please stand by...
```

The operating system then displays its prompt, A>, indicating it is ready to accept another operating system command.

To confirm that the MEMO.TXT file has been saved, display the directory of the diskette. Type:

```
A>DIR B: Return
```

Screen 27 shows the directory with the MEMO.TXT file included.

```
A>
A>DIR B:
B: MEMO    TXT
A>
```

Screen 27. Directory of Drive B

Storing a New Document on a Diskette

If there is not enough space to store a file on the diskette, after you press K, RED displays the following message:

```
Sorry can not open document
```

This means that the maximum number of files in a directory has been reached. Creating or editing the current file exceeds the maximum. CP/M-86/80 allows 128 directory files.

When you create or edit a file, RED creates a temporary file (with the file type .$$0). If the diskette has 127 directory files and you create a file, the temporary file becomes file number 128. Therefore, when you finish with the file, it cannot be stored on the diskette because the number of files is exceeded. *RED displays the message and the contents of the current file are lost.*

> **IMPORTANT**
> To avoid this message and the loss of your file, before using RED, check the directory of the diskette to make sure that less than 128 directory files exist.

If RED does display the message, before creating another file, you should:

- Erase any unneeded files on the diskette, or
- Insert another diskette with free space on it

Printing Text

The Output command (**O**) sends a marked section of a document to a printer. However, before you can print using this command, you must:

1. Make sure the computer is connected to a printer
2. Make sure the Set-Up features are compatible with the printer characteristics

   (Refer to the Rainbow Owner's Manual for this information.)
3. Make sure the printer is turned on

   If steps 1 through 3 are not done, you must return to the operating system (A>) to do them.
4. Make sure you are in the editor. If you left the editor, type:

   ```
   A>RED B:MEMO.TXT Return
   ```

RED displays the header lines and the memo.

Now type:

```
O
```

The command line changes to:

```
>OUTPUT: Top Bottom From
```

At this point you can either:

- Print the whole document by typing

  ```
  T
  ```

  for top followed by

  ```
  B
  ```

  for bottom

- Print a section of the document by setting pointers. (Pointers are discussed in Section 2 of this chapter.)

After you perform one of these steps, the text is printed on the printer. The carriage return symbols (<) are not printed.

> **NOTE**
> You can also print the document, without being in the editor, by using PIP. Refer to Chapter 2 for a description of the PIP command.

Section 2
Advanced Commands

There are other commands which you can use to perform more advanced tasks, such as:

- Combine two or more documents.
- Move sections of text to another location in the same document.
- Copy sections of text within a document.
- Create a new document from a section of an existing document.
- Permanently erase a document.
- Change the column width displayed on the screen.

To perform these tasks, you must move the cursor. In addition to the keys listed in Table 12, there are two other commands and one other key that move the cursor:

- GOTO command
- LOCATE command
- Find key

Using the Goto Command

The Goto command (**G**) moves the cursor to any of four different locations: Top, Bottom, Line, or to any preset pointer. This command is useful for moving the cursor quickly.

Go back to the document by typing:

```
A>RED B:MEMO.TXT Return
```

Then type:

```
G
```

In a new command line, RED asks you where you want the cursor to move. (See Screen 28a.)

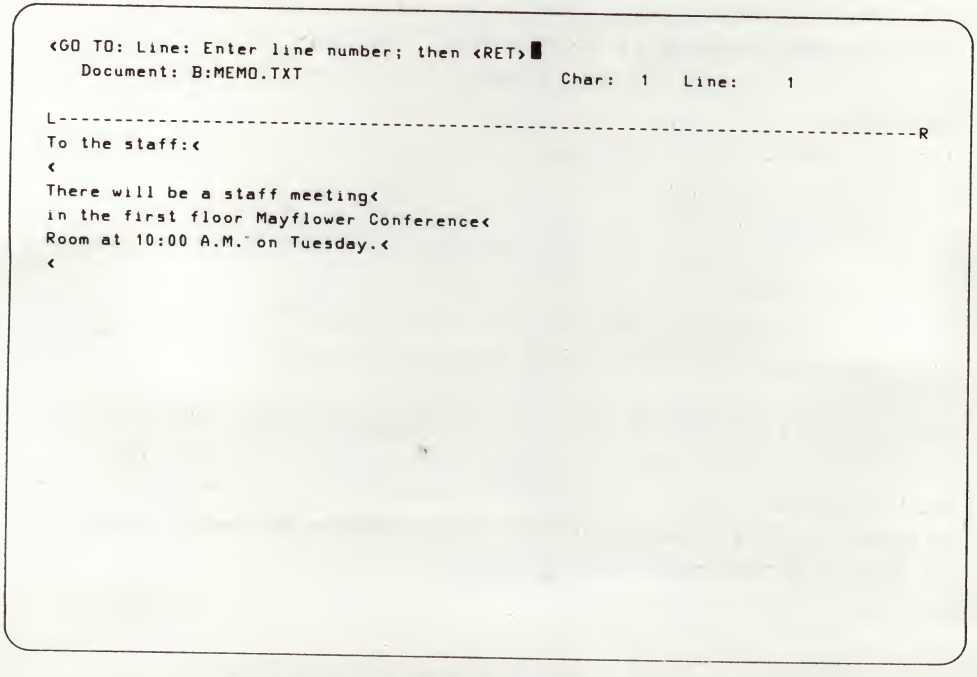
```
>GO TO: Top Bottom Line
 Document: B:MEMO.TXT                    Char:  1   Line:    1

L-------------------------------------------------------------------------------R
To the staff:<
<
There will be a staff meeting<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
```

Screen 28a. Using the Goto Command

To move the cursor to a specific line, type:

```
L
```

In a new command line, RED instructs you to type the line number and press the Return key. (See Screen 28b.)



Screen 28b. Using the Goto Command

Type:

```
4 (Return)
```

The cursor should now be on the first character (i) in the fourth line. A 4 is displayed next to the word "Line:" on the Status Line.

Using the Locate Command

The Locate command (L), or the Find key, searches for any character, word, or symbol in your document. This command is useful for moving the cursot quickly to a specific character in the document.

A search always moves in the direction indicated by the angle bracket to the left of the word "RED:" in the command line. Before using the Locate command, you should check the direction of the angle bracket. If it is not pointing in the desired direction, change it by typing the left angle bracket key (<) or –, or the right angle bracket (>) or +. To be sure that RED finds the first location of the specified text, move the cursor to the top of your document and type:

```
L
```

In a new command line, RED instructs you to enter the text you are searching for and press the Return key when finished.

The number 1 in front of the command indicates that only the first occurrence of the entry is being searched for. If you want to search for any other occurrence, type the number followed by L. For example, if you want to locate the fifth occurrence of the entry, position the cursor at the top of the document and type:

```
5L
```

NOTE
It is important to type the text exactly as it was typed in your document. This includes using uppercase and lowercase characters where appropriate. To locate a word like "the" which may be part of "other", do the following:

Type a space

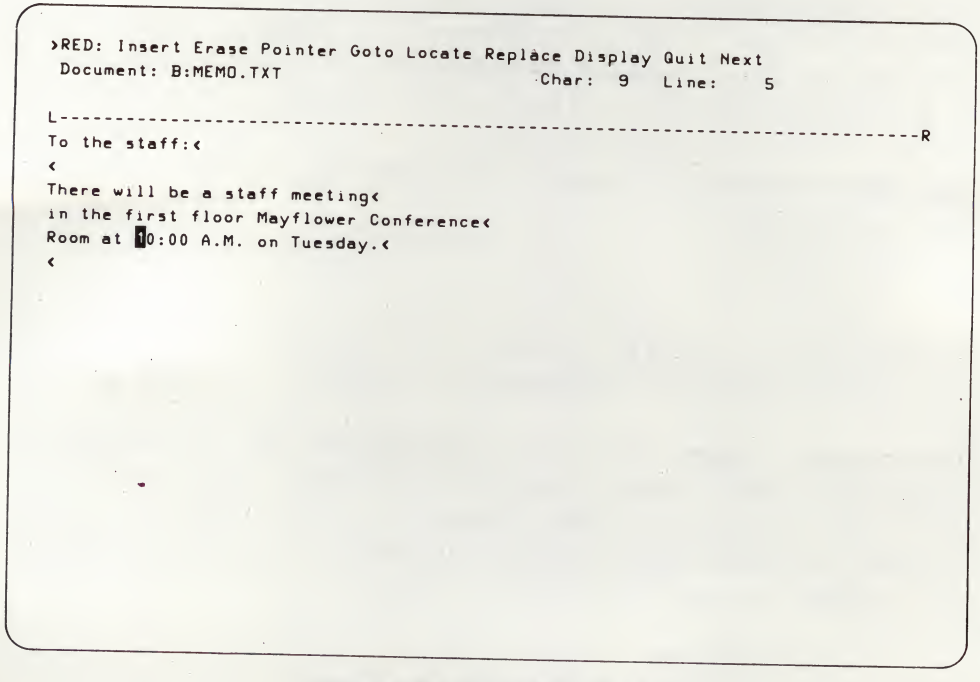
Type *the*

Type another space

For this example, type:

10:00 Return

The cursor moves to the 1 in "10:00" and the first command line redisplays on the screen. (See Screen 29.)



Screen 29. Locating Text

Note that RED also displays the character number and line number on the status line. You can now perform one of several tasks, such as erasing, moving, or replacing the text.

Viewing Another Document

The View command (V) allows you to view one document, while editing another document. This command is useful if you need to make a reference in the current document to something specific in another document. Type:

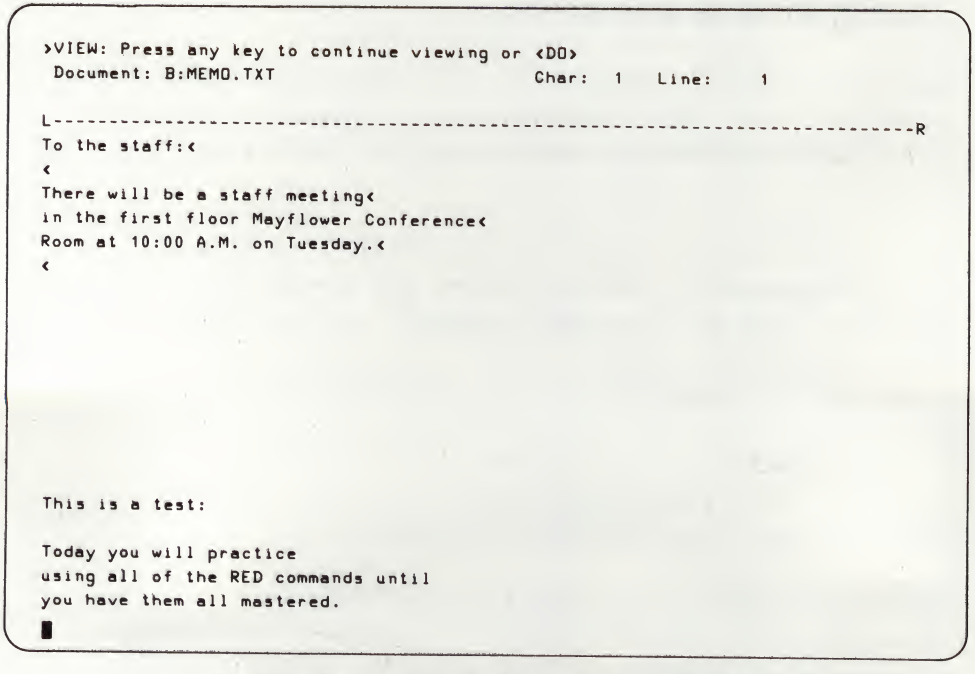
```
V
```

In a new command line, RED asks you to type the name of the document you want to view, then press the Return key. For this example, type:

```
A:PRACTICE.TXT (Return)
```

> **NOTE**
> PRACTICE.TXT already exists on the diskette containing the CP/M-86/80 operating system.

RED displays the document PRACTICE.TXT in the lower half of the screen. (See Screen 30.) The text is also in a lower intensity than the document you are working on. To return to the document you are working on, press the Do key.



Screen 30. Viewing Another Document

NOTE
If the current document is long, RED scrolls a few lines out of view until there is enough space on the screen for the document you want to look at.

Listing Document Names

The Append command lets you either see a directory list of document names or add an existing document to the end of another. To see a list of document names, type:

```
A
```

RED displays the two APPEND commands: List and Insert. List is the same as the CP/M-86/80 command, DIR. However, using List prevents you from having to leave RED, return to the operating system prompt, and type the DIR command to list the directory of your files.

To list your file names from RED, type:

```
L
```

RED requests the drive name. At this point, you can do any of the following:

- List all your documents by typing the name of the drive you are working on, then pressing the Return key. Type:

  ```
  B:
  ```
  (Return)

  The Append command is displayed again. Below the command line, the file names are listed. (See Screen 31a.)

```
>APPEND: List Insert
 Document: B:MEMO.TXT                          Char:  1   Line:    7

L-------------------------------------------------------------------------------R
B:MEMO      $$0      B:MEMO      TXT


There is space for 382,000 characters on this disk;  It is 2% full
```

Screen 31a. Append Command: List

- List a group of documents by using wildcards. Type:

  ```
  B:*.TXT Return
  ```

- List one document by typing the drive name and the name of the document. Type:

  ```
  B:MEMO.TXT Return
  ```

To return to the document, press the Do key.

If you look at the entire list, you see that, in addition to MEMO.TXT, there is a document called MEMO.$$0. This is a temporary document that RED creates.

Appending One Document to Another

The Append Insert command allows you to append an entire document to the end of another document. This command is useful, for example, if you created a report as one document and a chart as another document. Then you wish to combine the chart into the report.

To add PRACTICE.TXT to the end of MEMO.TXT, move the cursor past the last carriage return at the end of the memo. Then type:

```
A
```

In response to

```
>APPEND: List Insert
```

type:

```
I
```

RED instructs you to enter the file name and then press the Return key. Type:

```
A:PRACTICE.TXT (Return)
```

NOTE
Be sure to include the drive name (A:).

RED appends the document PRACTICE.TXT to the end of the document MEMO.TXT.

Screen 31b shows the two documents together.

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
 Document: B:MEMO.TXT                        Char:  1   Line:    7

L-------------------------------------------------------------------------------R
To the staff:<
<
There will be a staff meeting<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
This is a test:<
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
<
```

Screen 31b. Appending Two Documents

Using Pointers with Commands

The Move, Copy, Zap, Output, and Write commands are used in conjunction with the Pointer command (P). Pointers act as markers to section off portions of text for moving or erasing. You can set up to eight pointers and can reassign a pointer by reusing the number.

The general procedure for using these commands is as follows:

1. Move the cursor to a location.
2. Type

   P

3. Type a pointer number (1-8).
4. Repeat steps 1, 2, or 3 if necessary, using different pointer numbers.
5. Type the Move, Copy, Zap, Output, or Write command.
6. Type the number of the pointer.
7. Repeat step 6 if necessary.

The following examples show you how to use pointers to move, copy, and erase text.

Moving Sections of Text

The Move command (M) moves a marked section of text from one part of a document to another. This is a useful command if you want to move an entire paragraph or section of a document to another location within the document.

In the newly combined documents, move the cursor to the "T" in "This" in the seventh line. Type:

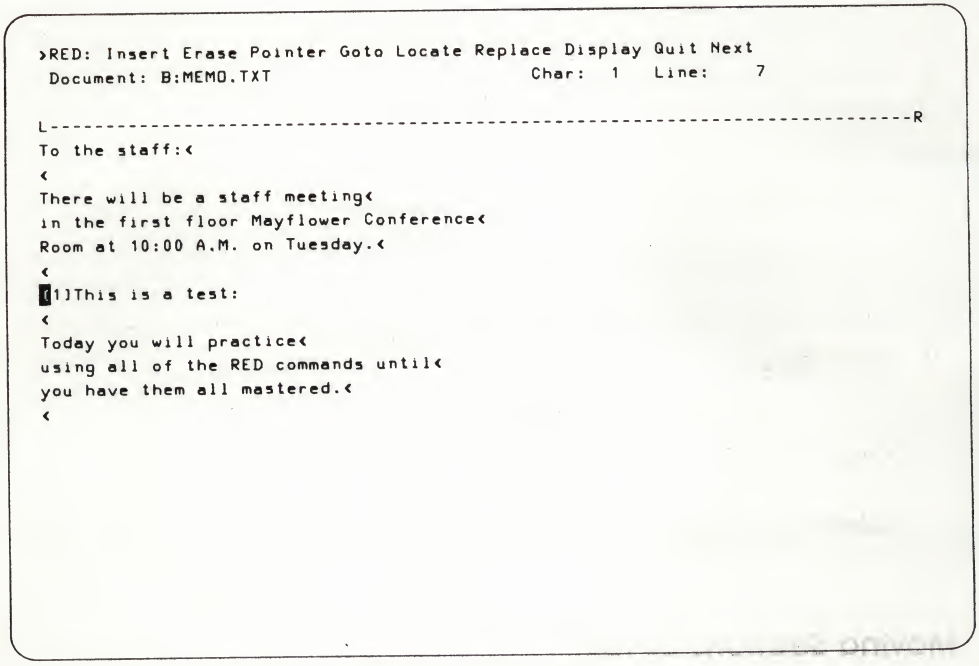
P

In a new command line, RED instructs you to set a pointer using the numbers 1 through 8.

Type:

```
1
```

RED marks the spot with a [1] in a lower intensity than the rest of the screen. (See Screen 32a.)



Screen 32a. Setting the First Pointer for Move

To set the next pointer, move the cursor to the line after the last line of text. The first marker [1] temporary disappears.

If you move the cursor with the GB (Goto Bottom) command, the top line of text scrolls out of view.

You are now ready to set the second pointer. Type:

```
P
```

RED again instructs you to set a pointer. Type:

```
2
```

RED sets the second pointer at the end of the text and redisplays the first pointer and the command line. The pointers are displayed in a lower intensity than the rest of the screen. (See Screen 32b.)

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
 Document: B:MEMO.TXT                    Char:  1   Line:    13

L-------------------------------------------------------------------------------R
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
[1]This is a test:<
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
<
 [2]
```

Screen 32b. Setting the Second Pointer for Move

Now, move the cursor to the top line of text using the GT (Goto Top) command. This indicates where you want the text moved. When you move the cursor, all pointer markers disappear from view.

You are now ready to execute the Move command. Type:

```
M
```

RED asks you to indicate the beginning of the text you want to move. (See Screen 32c.)

```
>MOVE: Top Bottom 1 2 From
 Document: B:MEMO.TXT                          Char:  1   Line:    1

L-------------------------------------------------------------------------------R
To the staff:<
<
There will be a staff meeting<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
This is a test:<
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
<
```

Screen 32c. Moving Text

Four choices are shown on the command line: Top, Bottom, (Pointer)1, and (Pointer)2. Type:

```
1
```

RED now asks you to indicate the end of the text you want to move.

Type:

```
2
```

RED redisplays the command line and reverses the two documents. (See Screen 32d.) The two documents are now reversed.

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
 Document: B:MEMO.TXT                        Char:  1   Line:    1

L-------------------------------------------------------------------------------R
This is a test:<
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
<
To the staff:<
<
There will be a staff meeting<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
```

Screen 32d. Moved Text

Copying Sections of Text

The Copy command (C) copies a marked section of text from one part of a document to another. This is useful if you are using the same information in more than one place in the document.

Make sure the cursor is at the top of the document bu using the GT (Goto Top) command.

You are now ready to set pointers. Type:

```
P
```

RED displays the location of the pointers that were set in the Move command. Both the pointers on the command line and in the document are displayed in a lower intensity than the rest of the text. (See Screen 33a.)

```
 >SET POINTER 1 2 3 4 5 6 7 8
 Document: B:MEMO.TXT                    Char:  1   Line:    1

L-------------------------------------------------------------------------------R
This is a test:<
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
<
To the staff:<
<
There will be a staff meeting<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
[1][2]
```

Screen 33a. Setting Pointers for COPY

You can reset the two pointers using the same numbers. When you do this, you delete the previously set pointers. Type:

```
1
```

RED resets the first pointer. The second pointer currently remains set at the end of the text.

Move the cursor to the carriage return symbol after the last line of text in PRACTICE.TXT. Type:

```
P
```

Then type:

```
2
```

The second pointer is now reset as shown in Screen 33b.

```
 >RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
 Document: B:MEMO.TXT                    Char:  1   Line:    6

L-------------------------------------------------------------------------------R
[1]This is a test:<
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
[2]
To the staff:<
<
There will be a staff meeting<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
```

Screen 33b. Pointers Set for Copy

To copy the marked text at the end of the second memo, move the cursor to the carriage return symbol on the line following the last line of text.

Now use the Copy command. Type:

```
C
```

RED asks you to indicate the beginning of the text you want to copy. Type:

```
1
```

RED now asks you to indicate the end of the text you want to copy. Type:

```
2
```

RED copies the marked text and places it after the current cursor position. (See Screen 33c.)

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
 Document: B:MEMO.TXT                          Char:  1   Line:    6

L--------------------------------------------------------------------------------R
This is a test:<
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
This is a test:<
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
<
To the staff:<
<
There will be a staff meeting<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
```

Screen 33c. Copied Text

Creating a New Document from an Existing Document

The Write command (W) creates a new document containing sections of text that you mark in an existing document. It is a useful command for creating stock paragraphs for form letters, memos, or contracts.

Move the cursor to the beginning of line 12: "To the Staff:". Type:

```
P
```

RED displays the pointers that you set using Copy.

To reset the first pointer, type:

```
1
```

Move the cursor to the carriage return character at the end of the document.

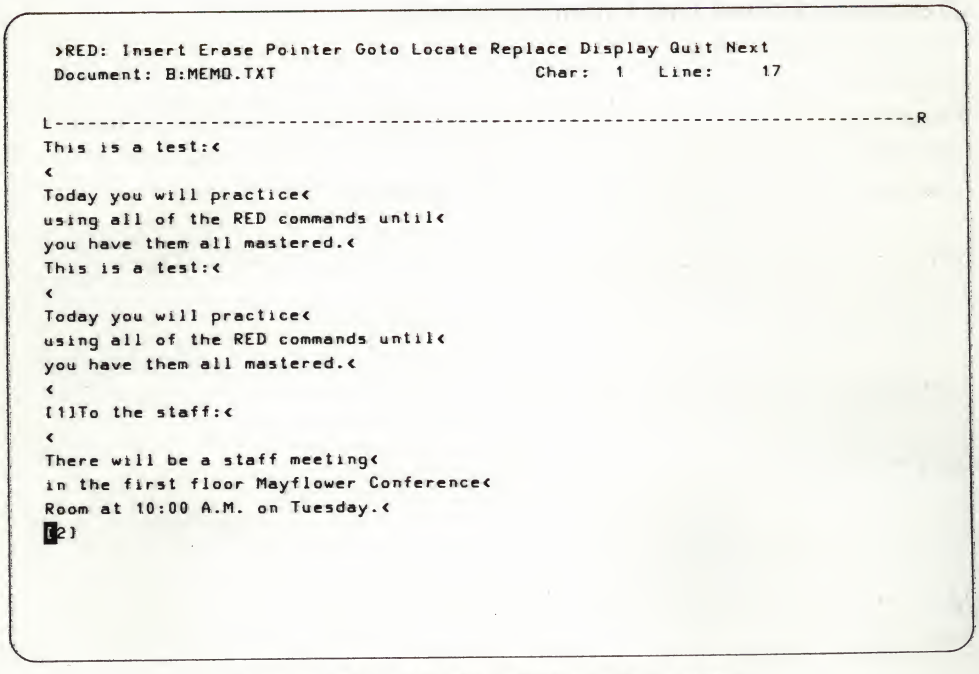
To reset the second pointer, type:

```
P
```

and then type:

```
2
```

RED displays the two new pointers. (See Screen 34a.)



Screen 34a. Setting Pointers for Write

You are now ready to use the Write command to create a new document. Type:

```
W
```

RED asks for the beginning and end of the text you want copied to the new file. Type:

```
1
```

Then type:

```
2
```

RED then requests a document name. (See Screen 34b.)

```
>WRITE: Top Bottom 1 2 From 1, to 2 to Document
 Document: B:MEMO.TXT                    Char:  1   Line:    17

L-------------------------------------------------------------------------------R
This is a test:<
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
This is a test:<
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
<
To the staff:
<
There will be a staff meeting<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
```

Screen 34b. Write Command

Remember that RED accepts only valid CP/M-86/80 file names. Type:

B:MEETING.TXT (Return)

RED displays the command line, but does not change the text. However, the pointers are no longer visible. Now the marked section is in the file MEETING.TXT.

Looking at the New Directory

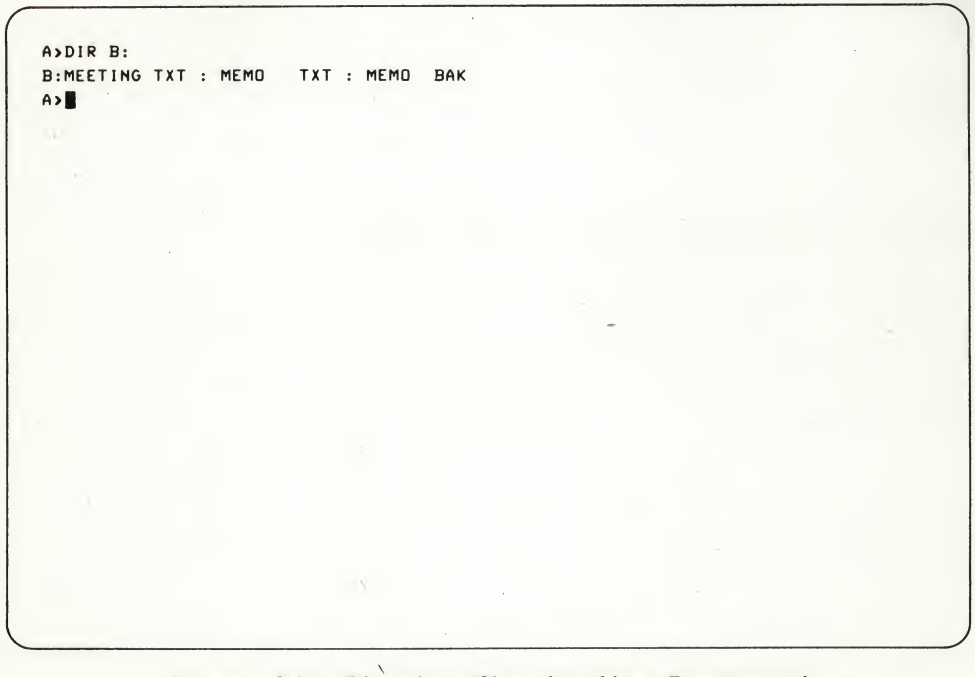
To make sure the new document exists, use the View command, or return to the operating system and look at the directory as follows:

1. Type **Q** for Quit.
2. Type **K** for Keep.

   You are now back to the operating system.
3. Next to the system prompt, type:

   A>DIR B: Return

The CP/M-86/80 operating system displays the file directory as shown in Screen 34c. You now have the original document in MEMO.TXT and the new document in MEETING.TXT. (Remember that PRACTICE.TXT is on the system diskette in drive A.)



Screen 34c. Directory Showing New Document

Permanently Erasing Sections of Text

The Zap command (Z) permanently erases marked sections of a document. *You should use this command with care.*

Reenter the document, MEMO.TXT, byt typing:

```
A>RED B:MEMO.TXT (Return)
```

Move the cursor to the beginning of line 6: "This is a test:". Type:

```
P
```

RED instructs you to set a pointer. Type:

```
1
```

Move the cursor to the carriage return symbol at line 11. Type:

```
P
```

Then type:

```
2
```

RED resets the second pointer. (See Screen 35a.)

```
 >RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
 Document: B:MEMO.TXT                          Char:  1   Line:    11

L-------------------------------------------------------------------------------R
This is a test:
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
[1]This is a test:
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
[2]
To the staff:<
<
There will be a staff meeting<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
```

Screen 35a. Setting Pointers for Zap

You are now ready to erase the marked section of text. Type:

```
Z
```

RED asks you to indicate the beginning and end of the text you want to erase. The pointers are no longer visible. Type:

```
1
```

Then type:

```
2
```

RED erases the section you indicated and the original text remains. (See Screen 35b.)

```
>RED: Insert Erase Pointer Goto Locate Replace Display Quit Next
Document: B:MEMO.TXT                          Char:  1   Line:    6

L-------------------------------------------------------------------------------R
This is a test:<
<
Today you will practice<
using all of the RED commands until<
you have them all mastered.<
<
To the staff:<
<
There will be a staff meeting<
in the first floor Mayflower Conference<
Room at 10:00 A.M. on Tuesday.<
<
```

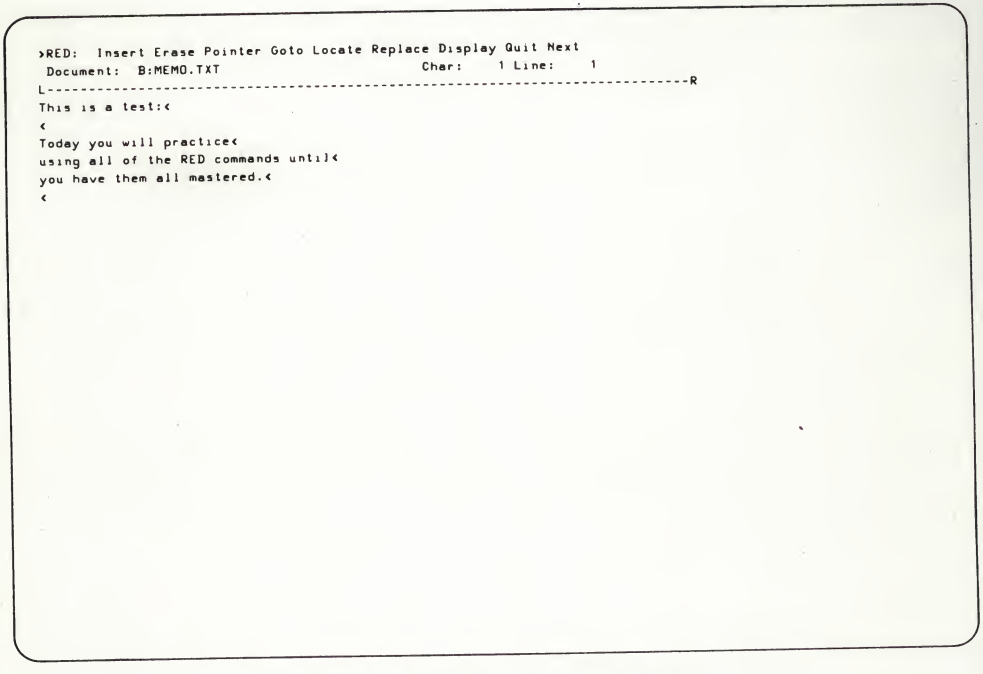
Screen 35b. Erased Text Using Zap

Changing Column Width

Normally, the width of the text displayed is 80 columns. However, if you have a large chart that is wider than 80 columns, you can change the width of the display on the screen as well as the width of the printed copy. To change the width from 80 columns to 132 columns, first leave the editor. Then, next to the system prompt, type:

```
A>RED B:MEMO.TXT/W Return
```

Screen 36 shows the text in small column width. When you return to the operating system, the original width of 80 columns automatically returns.



Screen 36. 132 Column Width

4

Creating a System/Application Diskette

This chapter describes the procedure to create a diskette that includes the program you need to start the operating system as well as an application program. This will become the system/application diskette.

Application programs solve specific problems or do specific jobs, such as word processing (SELECT-86), or financial planning (Multiplan-86).

Why Create a System/Application Diskette?

If you are using an application program routinely, you should copy the operating system programs and the application program to a *single diskette.* By doing this, you can use the same diskette to start the operating system and also to run the application program. Because you use one drive for this diskette, you have a free drive for a data diskette: a diskette that you use with the application program to store information, such as the text of a memo.

Application programs you can copy include:

- Programs created for the Rainbow computer.
- Programs configured for DIGITAL's VT180 personal computer (refer to the application program's documentation to determine if the program can be configured for the VT180 personal computer)
- Programs stored on an 8-sector, single-sided IBM diskette.

How to Create a System/Application Diskette

Follow the steps in the next two sections of this chapter to make a system/application diskette.

1. In the section titled: "Copying the Operating System Files," you copy the operating system onto a blank diskette.
2. In the section titled: "Copying the Application Program", you copy the application program from a Rainbow compatible diskette, an IBM compatible diskette, or a VT180 compatible diskette onto the diskette to which you just copied the operating system.

Copying the Operating System Files

1. Display the Rainbow Main System Menu according to either of the following procedures:
   - Turning on the Rainbow computer if it is turned off.
   - Resetting the Rainbow computer if it is turned on.
2. Remove the CP/M-86/80 working diskette (the diskette you copied in the *Rainbow CP/M-86/80 Getting Started* manual) from its protective envelope.
3. Open the drive A door and insert the CP/M-86/80 working diskette. Close the drive A door. **This diskette cannot have a write-protect tab on its write-protect notch.**

4. Start the CP/M-86/80 operating system by pressing the A key in response to the Main System Menu. `A>` should be the last characters displayed on the screen.
5. Remove a blank diskette from the diskette box in the CP/M-86/80 Operating System Kit. This will become the system/application diskette containing:

   - The essential operating system files needed to start the operating system.
   - The system programs: MAINT, PIP, DISKCOPY, COPY, STAT and SUBMIT.
   - The application program.

6. Open the drive B door and insert the blank diskette. Close the drive B door.

   NOTE
   If you did not turn on or reset the computer before inserting the diskettes, by pressing the Set-Up key followed by holding the Ctrl key and pressing the Set-Up key at the same time, type Ctrl/C after the prompt to tell the operating system that you have inserted new diskettes into the drives.

   NOTE
   If any messages are displayed at any time during the following procedure, refer to Appendix B of this guide. For example:

```
DRIVE NOT READY -- OPEN DOOR OR NO DISKETTE
```

indicates that there is no diskette in drive B.

7. After the A>, type:

```
A>SUBMIT SYSCOPY A B (Return)
```

This instructs the operating system to run a program called SYSCOPY to copy the necessary files and programs from the CP/M-86/80 working diskette in drive A to the blank diskette in drive B. After you type this command, the operating system displays other instructions as shown in Screen 37. (The entire procedure should complete in about two minutes.)

```
A>SUBMIT SYSCOPY A B
A>LDCOPY A: B:
LDCOPY VERS 1.6

A>PIP B: = A:*.SYS[ROV]

COPYING -
CPM.SYS
Z80CNF.SYS

A>PIP B:=A:MAINT.CMD[ROV]

A>PIP B:=A:PIP.CMD[ROV]

A>PIP B:=A:DISKCOPY.COM[ROV]

A>PIP B:=A:COPY.COM[ROV]

A>PIP B:=A:SUBMIT.CMD[ROV]

A>PIP B:=A:STAT.CMD[ROV]

A>PIP B:=A:HELP.*[ROV]

COPYING -
HELP.CMD
HELP.HLP

A>
```

Screen 37. SYSCOPY Dialog

8. Check that all the files with the Directory attribute were copied. After the operating system prompt, type:

   A>DIR B: Return

   The file names and prompt should be displayed on the screen as shown in Screen 38.

```
A>DIR B:
B: MAINT      CMD : PIP      CMD : DISKCOPY COM : SUBMIT CMD
B: STAT       CMD : HELP     CMD

SYSTEM FILE(S) EXIST
A>
```

Screen 38. Directory File Names on the Diskette in Drive B

9. Check that all system files were copied. After the system prompt, type:

   A>DIRS B: (Return)

   The file names and prompt should be displayed on the screen as shown in Screen 39.

```
A>DIRS B:
B: CPM      SYS : Z80CNF      SYS : COPY      COM : HELP      HLP

NON-SYSTEM FILE(S) EXIST
A>
```

Screen 39. System File Names on the Diskette in Drive B

You have now successfully copied the operating system files to the diskette in drive B. Go to the next section to copy the application program onto this diskette.

Copying the Application Program

1. Remove the CP/M-86/80 working diskette from drive A. Return it to its protective envelope and store it in a safe place.
2. Remove the other diskette from drive B. This was the blank diskette to which you have just copied the operating system files.
3. Insert this diskette into drive A and close the door.
4. Insert the application program working diskette into drive B. (This is the diskette that the application package, such as SELECT-86 or Mulitplan-86 is stored on.) Close the drive B door.
5. To tell the operating system that you have changed diskettes, type:

   A> Ctrl/C

6. Copy the application program (in drive B) onto the diskette already containing the operating system (in drive A). To do this, use PIP, the command that copies files from one diskette to another diskette. The number of files that make up an application program working diskette varies. Hence, the time it takes to copy these files will vary.

   NOTE
   If any messages are displayed at any time during the following procedure, refer to Appendix B in this guide.

   Type:

   ```
   A>PIP A:=B:*.*[ROV] Return
   ```

   where:

   A: is the location you are copying to (the destination drive).

   B: is the location you are copying from (the source drive).

   . is a symbol indicating all files.

   [ROV] are added instructions for PIP.

As the application program files are being copied, PIP displays:

```
COPYING --
```

followed by a list of all the file names as they are copied. The file names are the same names as those on the source diskette in drive B. When all the files are copied, the operating system displays:

```
A>
```

7. Remove the application program diskette from drive B. Return it to its protective envelope and store it in a safe place. The diskette in drive A is now the system/application diskette.
8. If desired, you can now insert a data diskette into drive B to use with the application program. If you insert another diskette into the drive, type:

   A> Ctrl/C

   to let the operating system know you have changed diskettes.

With this one diskette, you can now start the operating system and use your application program. Use this procedure to make system/application diskettes for as many application programs as you have. Be sure to write the following information, with a felt tipped pen, on the system/application diskette's label:

- The name of the operating system that is stored on the diskette: the CP/M-86/80 operating system.
- The name of the application program that is stored on the diskette.

Described above is the preferred method of creating a system/application diskette. Refer to the discussion of the SUBMIT program in Chapter 2 of this guide if you want to customize this procedure to copy other files.

Starting Application Programs

To start the application program, refer to your application program's documentation. In most cases, you type the name of the program followed by pressing the Return key.

> **IMPORTANT**
> If your application program requires you to change diskettes, you may need to type Ctrl/C before starting the program. This prevents the program from stopping.
>
> Typing Ctrl/C directly after the prompt, tells the operating system that you have inserted a different diskette into the drive. Typing Ctrl/C after the application program has started can cause the program to stop. Refer to the application program's documentation for specific instructions.

If you are using an application program for the first time, you should type some test information on the diskette to ensure that the program is working correctly.

Cursor Movement in VT180 Programs

While running certain application programs configured for digitals VT180 personal computer, the directional arrow keys: the up, down, left and right arrow keys, may not move the cursor properly. In this case, use the corresponding control characters listed in Table 13 instead of the arrow keys:

Table 13. Control Characters

Directional Arrow Keys	Control Character Keys
Up Arrow (↑)	Ctrl/E
Down Arrow (↓)	Ctrl/X
Right Arrow (→)	Ctrl/D
Left Arrow (←)	Ctrl/S

Copying Data or Programs from VT180 or IBM Diskettes

If you want to copy the data files or programs you have stored on VT180 diskettes to a Rainbow diskette, follow the steps below.

1. Display the Rainbow Main System Menu according to one of the following procedures:
   - Turn on the Rainbow computer if it is turned off.
   - Reset the Rainbow computer if it is turned on.
2. Remove the CP/M-86/80 working diskette from its protective envelope.
3. Open the drive A door and insert the CP/M-86/80 working diskette.
4. Start the CP/M-86/80 operating system by pressing the A key in response to the Main System Menu. `A>` should be the last characters displayed on the screen.
5. Remove the VT180 or IBM diskette from its protective envelope.
6. Open the drive B door and insert the VT180 or IBM diskette.

   NOTE
   If you did not turn on or reset the computer just before inserting the diskettes, type Ctrl/C to tell the operating system that you nave inserted new diskettes into the drives.

7. Use PIP to copy all or some of the data files or programs from the VT180 or IBM diskette to the CP/M-86/80 working diskette.

   NOTE
   If any messages are displayed at any time during the following procedure, refer to Appendix B of this guide.

Type:

```
A>PIP A:=B:*.*[ROV] Return
```

or

```
A>PIP A:=B:filename.typ [V] Return
```

IMPORTANT

If there is not enough space to copy all your VT180 data files onto the CP/M-86/80 working diskette, PIP displays the following error message:

```
ERROR: diskette WRITE - [drv:filename.typ]
```

If you see this error message, create a system diskette with a limited number of files. To do this, follow the instructions in the section titled "Copying the Operating System Files" at the beginning of this chapter. By using the SUBMIT program described in that section, you copy only the necessary operating system files and five operating system programs onto the diskette. Then insert this diskette into drive A instead of the CP/M-86/80 working diskette as instructed in step 3. With fewer operating system files on this diskette, you can copy all your VT180 or IBM files. You can then copy these files to a separate "data" disk, if desired, by using PIP.

5

How To Backup and Restore Hard Disk Files

What is in this Chapter

This chapter describes how to use the BACKUP program to copy a group of files to and from the hard disk.

Purpose

BACKUP is a program that allows you to copy files from the hard disk to diskettes (backup) and copy them back onto the hard disk (restore).

Restore is generally done to recover files that were accidentally erased from the hard disk.

Form

A>BACKUP Return

Instructions

Backing up files. To backup your files from hard disk to diskettes, follow the instructions below:

1. Set the date and time by typing:

   ```
   A>DATE dd-mon-yy hh:mm:ss
   ```

   Where:

   dd
   Is the day

   mon
   Are the first three letters of the month

   yy
   Are the last two digits of the year

   hh:
   Is the hour

   mm:
   Are the minutes

   ss
   Are the seconds (optional)

2. Type:

   A>BACKUP (Return)

3. You see a screen called `Main Screen`.
4. According to the instructions at the bottom of the displayed screen, select Option 1 by pressing:

   ⬇

   or typing the number 1.

5. Press the Do key.

6. From the second displayed screen: Standard Backup Options, press:

   ⬇

   to move the arrow to the first line. Then press:

   ➡

   to select the source drive (the drive from which the files will be copied).

   NOTE
   If you are not sure what an option means, select the option by moving the arrow to the option you need help on, and press the Help key.

7. Press:

   ⬇

   again to move the arrow to the second line. Then press:

   ➡

   to select the destination drive (the diskette drive on which you want the files copied.)

8. Choose to copy:

   - All files by not making any more selections and pressing the Do key
   - Only files that have changed since the last time the backup program was run. To do this, press:

     ⬇

     to move the arrow to the third line. Then press:

     ➡

     to select the CHANGED option. Press the Do key.

After the BACKUP program starts, you are prompted to insert a diskette. When that diskette is full, you are prompted to insert another diskette.

As BACKUP copies the files, each file name is displayed on the screen. When the program is done you see a brief message indicating that the back-up procedure has completed, and the `Main Screen` is displayed again.

Each backup option is described in Chapter 6.

Restoring Files. To restore files from diskettes back to the hard disk, follow the instructions below:

1. Type:

   A>BACKUP (Return)

2. From the `Main Screen`, press:

   ↓

   or type the number 2 to move the arrow to the second line.
3. Press the Do key.
4. From the second displayed screen: `Standard Restore Options`, press:

   ↓

   to move the arrow to the first line. Then press:

   →

   to select the source drive (the drive from which the files will be restored.)
5. press:

   ↓

   again to move the arrow to the second line. Then press:

   →

   to select the destination drive (the diskette drive onto which you want the files restored.)

6. Choose to restore:

   - All files by not making any more selections and pressing the Do key
   - Certain files that you specify. To do this, press:

     ↓

     to move the arrow to the third line. Then type the names of the files you want restored. Then press the Do key.

     NOTE
     If you are not sure of how to specify a group of files, refer to the section called "Restore File Specifier" in Chapter 6 of this guide.

After the program starts, you are prompted to insert a diskette. When all the files have been restored from that diskette, you are prompted to insert another diskette.

As BACKUP restores the files, each file name is displayed on the screen. When the program is done you see a brief message indicating that the procedure has completed, and the `Main Screen` is displayed again.

Each restore option is described in Chapter 6.

What To Do Next

Proceed to Chapter 6 for more information about the hard disk. Chapter 6 includes:

- Starting the operating system from the hard disk.
- Changing the default partitions.
- Detailed features of the backup and restore program.
- Recovering from hard disk problems.

6

Advanced Hard Disk Procedures

What is in this Chapter

In Chapter 5, you learned the basic procedure for backing up and restoring files.

This chapter describes how to use the hard disk for more detailed operations. The chapter is divided into a description of the hard disk followed by four sections that show you how to:

1. Start the operating system from the hard disk
2. Change the default partitions
3. Backup and restore operations (advanced features)
4. Recover from hard disk problems

What is a Hard Disk?

The hard disk (called a Winchester disk) can be added onto the Rainbow computer. This disk provides greater storage for large files or many small files, and greater speed in using files.

In terms of type-written pages, a diskette stores about 150 pages of text; the hard disk stores about 3750 pages.

> **NOTE**
> If you have a disk with a storage capacity of five megabytes instead of ten, the number of pages is half this amount.

The hard disk provides you with additional space that is defined in megabytes. A byte is equal to one character, and a megabyte is equal to a million characters. The hard disk provides you with ten megabytes of additional storage space, which is equivalent to 25 times the storage capacity of a single diskette.

The disk can simulate up to four diskette drives, each with a much larger capacity than a single diskette.

Because of its speed and large working capacity, you may want to use the hard disk to store the programs and files you use daily, and use diskettes for storing less-used files.

> **NOTE**
> If you are using an application program, it is recommended that you store it on the hard disk and store data files on diskettes.

Figure 11 shows where the hard disk fits into the Rainbow computer.

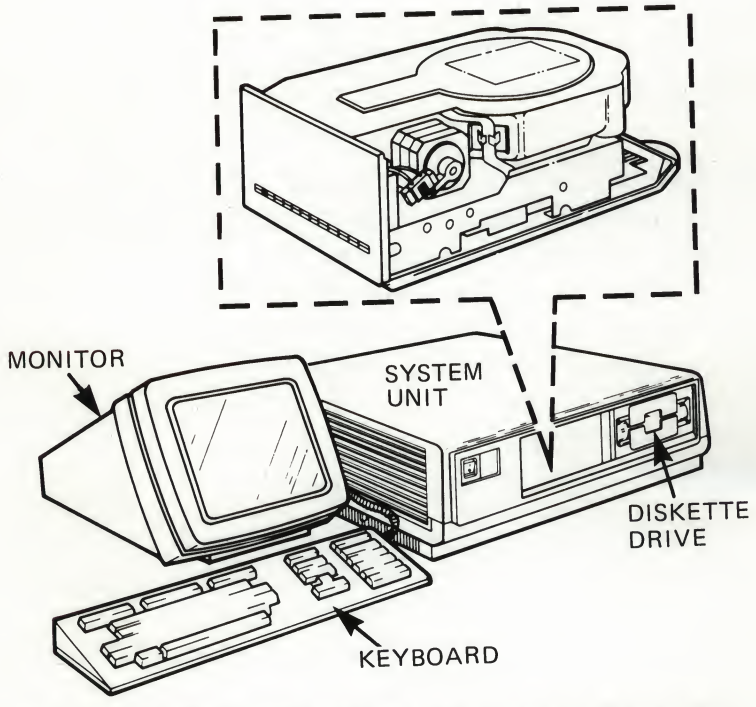


Figure 11. The Hard Disk in the Rainbow Computer

For a description of installation procedures, refer to the *Rainbow Winchester Disk Option Installation Guide.*

Section 1
Starting the Operating System from the Hard Disk

Make sure the hard disk is installed according to the procedures in the *Rainbow Winchester Disk Option Installation Guide*, and you have run the install program described in the same guide.

To be able to automatically start the CP/M-86/80 operating system from the hard disk, follow the instructions below:

1. Turn on the computer.
2. Insert the operating diskette into drive A.
3. From the Main System Menu, type:

   ```
   A
   ```

   NOTE
   If the W option is not displayed on the Main System Menu, you cannot start the operating system from the hard disk. You can, however, use the hard disk to store and work with files.

4. You must then copy the operating system onto the hard disk. To do this, in response to the system prompt, A>, type:

   ```
   A>SUBMIT SYSCOPY A: drv: Return
   ```

   Where drv: is the hard disk drive from which you want to start the operating system.

   This instructs the operating system to run the program called SYSCOPY to copy the necessary operating system files and programs from the diskette in drive A to the hard disk drive E. After you type this command, the operating system displays other instructions to complete the procedure.

NOTE
Proceed to Step 5 only if you see the message

```
Cannot find file: HBOOT.LDX on source diskette
Try LDCOPY drv:HBOOT.LDX if you want to copy a loader
to the hard disk
```

Otherwise, the system responds with the A> prompt, and you can proceed to step 6.

5. Run the CP/M-86/80 program called LDCOPY by typing:

```
A>LDCOPY A:HBOOT.LDX Return
```

You are then asked to supply the destination drive name. Type:

```
drv: Return
```

In this example,

A:	Is the source drive from which you are copying the program called HBOOT.LDX.
HBOOT.LDX	Is the name of the program that you are copying from drive A. The LDCOPY program copies HBOOT.LDX onto the specified destination drive (drv:) to designate that hard disk drive as the one from which the operating system will run.
drv:	Is the hard disk drive from which you want to start the operating system.

When LDCOPY has finished, it displays the message:

```
Function complete
```

6. Locate the Rainbow hard disk utility program diskette that came in the same box with the *Rainbow Winchester Disk Option Installation Guide.* Insert this diskette into drive A.

7. Type:

Set-Up Ctrl/Set-Up

8. From the Main System Menu, type A. The Main Screen is displayed as shown in Screen 40.

```
          RAINBOW Hard Disk Utility Program (Version 0.16)
------------------------------------------------------------------------------

                              Main Screen
--->
     1.  Test and initialize the hard disk

     2.  Re-partition the hard disk

     3.  Show hard disk status

     4.  Run the hard disk diagnostic

     5.  Re-initialize the hard disk

     6.  Select auto-boot partition


To point to a selection, press the up arrow key, down arrow key
    or a number key.
On a line, press <Help> for more information
To begin the selected action, press <Do>
When finished with this program, insert a system diskette into Drive A
    and press <Set-Up> followed by <CTRL/Set-Up>.
```

Screen 40. Main Screen

9. From the Main Screen, press the down arrow key or type the number 6 to select *Option 6: Select auto-boot partition.* Then press the Do key.

Assuming you have not changed the default partitions, the following screen is displayed:

```
          RAINBOW Hard Disk Utility Program (Version 0.16)
------------------------------------------------------------------------------

                        Auto-Boot Partition Menu

Please select the partition from which you want auto-booting to occur:
( * = current auto-boot setting)

          Partition                          Operating
          Name              Drive            System
          ---------         -----            ---------
--->
      1.  CPM-1             E                CP/M-86/80
      2.  CPM-2             F                CP/M-86/80
      3. * None


For more information, press <Help>.
To change the auto-boot setting, press the up arrow key, down arrow key,
     or a number key to point to a selection, then press <Do>.
When the auto-boot setting is correct, press <Main Screen (F9)> to
     return to the Main Screen.
```

Screen 41. Auto-Boot Partition Menu

10. You must then select the drive from which you want the operating system to start the next time you turn on the computer. The choices depend on the partition arrangement you have selected. In this case, the drives are E, F, or none. The selection must match the drive you specified with the SUBMIT command. Make the selection by pointing to it with the arrow, then pressing the Do key.
11. After you make a selection, the asterisk (*) moves to that selection.
12. Follow the instructions at the bottom of the auto-boot partition menu to return to the Main Screen.
13. From the Main Screen, follow the instructions to insert a system diskette into drive A and press the Set-Up key followed by Ctrl/Set-Up. This action causes the Main System Menu to be displayed.

14. From the Main System Menu, press the Set-Up key.
15. Press the Next Screen key until you see:

```
SET-UP
TO EXIT PRESS "SET-UP"
PRESS "HELP"
TO RESET TYPE <CTRL/SET-UP>

04.05A
128K
LINE

AUTO-BOOT

?-DRIVE
```

Then press the up arrow key until the ? changes to W (for Winchester hard disk). Then press the Shift and S keys simultaneously to save the change you have made to the Set-Up parameter. Press the Set-Up key again to leave Set-Up. (Refer to the *Rainbow Owner's Manual* for more information about Set-Up.)

16. The next time you turn on the computer, the operating system automatically starts from the specified drive on the hard disk.

NOTE
You can also start the operating system from the hard disk by selecting W from the Main System Menu. To do this:

1. Follow steps 1 through 4.
2. The next time you reset or turn on the computer, select W from the Main System Menu.
3. After you select W, a screen is displayed with choices of hard disk drives. Select the drive that corresponds to the one you specified in the SUBMIT command. This is the drive from which the operating system will start.

Section 2
Changing the Default Partitions

Make sure the hard disk is installed according to the procedures in the *Rainbow Winchester Disk Option Installation Guide,* and you have run the install program described in the same guide.

After the disk has been successfully installed, it is automatically divided into two CP/M-86/80 partitions of equal size. A partition is a permanent storage area. It is similar to a diskette, but stores much more information; it can be changed, but not physically removed.

If you are not sure how the partitions are currently divided,

1. Turn on the computer.
2. Insert the Rainbow hard disk utility program diskette into drive A. This diskette is found in the box with the *Rainbow Winchester Disk Option Installation Guide.*

> **NOTE**
> From this point on, this diskette is referred to as the utility diskette.

3. Type:

```
A
```

4. Select *Option 3: Show hard disk status,* from the Utility Program Main Screen shown in Screen 42.

```
          RAINBOW Hard Disk Utility Program (Version 0.16)
------------------------------------------------------------------------------

                              Main Screen
--->
     1.  Test and initialize the hard disk

     2.  Re-partition the hard disk

     3.  Show hard disk status

     4.  Run the hard disk diagnostic

     5.  Re-initialize the hard disk

     6.  Select auto-boot partition


To point to a selection, press the up arrow key, down arrow key
    or a number key.
On a line, press <Help> for more information
To begin the selected action, press <Do>
When finished with this program, insert a system diskette into Drive A
    and press <Set-Up> followed by <CTRL/Set-Up>.
```

Screen 42. Main Screen

To select an option, press the up or down arrow keys, or type a number (1–6). For example, if you type the number 3, the arrow to the left at the top of the screen moves to the third option. Then press the Do key to start the program.

If you have not changed the default partitions, and you select Option 3 from the Main Screen, the following is displayed:

```
          RAINBOW Hard Disk Utility Program (Version 0.16)
--------------------------------------------------------------------------------

                              Hard Disk Status


The hard disk is initialized  with the following partitions:

Partition                     Operating
Name          Drive           System          Size
---------     -----           ---------       ----
CPM-1         E               CP/M-86/80      4.898MB
CPM-2         F               CP/M-86/80      4.898MB


To return to the Main Screen, press <Main Screen (F9)>.
```

Screen 43. Default Partitions

NOTE

If you have a disk with a storage capacity of five megabytes instead of ten, the partition sizes are different.

Why Change Partitions

Partitioning is a method of dividing the hard disk into one to four internal storage areas. The purpose of partitioning is to allow you to use the storage space in a way that best fits your needs. For example, if you are using more than one operating system, you may need to have one five-megabyte partition for one operating system, and two 2.5 megabyte partitions for the other.

> **NOTE**
> If you have a disk with a storage capacity of five megabytes instead of ten, the partition sizes are different.

The choices are:

1. One to four partitions of the CP/M-86/80 operating system only
2. One to four partitions of the MS-DOS operating system only
3. One or two partitions for the CP/M-86/80 operating system plus one or two partitions for the MS-DOS operating system

Changing Partitions

If you do not want the default partition arrangement of two equal-sized CP/M-86/80 partitions of five megabytes each, which was automatically selected for you during the installation procedure:

1. Turn on the Rainbow computer
2. Locate the utility diskette in the box with the *Rainbow Winchester Disk Option Installation Guide.* Insert the diskette into drive A.

3. In response to the Main System Menu, type:

```
A
```

4. The Main Screen is then displayed as shown in Screen 44.

```
          RAINBOW Hard Disk Utility Program (Version 0.16)
------------------------------------------------------------------------------

                              Main Screen
--->
     1.  Test and initialize the hard disk

     2.  Re-partition the hard disk

     3.  Show hard disk status

     4.  Run the hard disk diagnostic

     5.  Re-initialize the hard disk

     6.  Select auto-boot partition


To point to a selection, press the up arrow key, down arrow key
    or a number key.
On a line, press <Help> for more information
To begin the selected action, press <Do>
When finished with this program, insert a system diskette into Drive A
    and press <Set-Up> followed by <CTRL/Set-Up>.
```

Screen 44. Main Screen

5. Select *Option 2: Re-partition the hard disk,* by pressing the up or down arrow keys, or by typing the number 2.
6. Press the Do key.

> **NOTE**
> Changing the arrangement destroys any existing data. Therefore, if files were previously stored on the disk, be sure to back up all files you want to save before making a change.

When you choose this option, you are given a choice of which operating system(s) you want to use:

```
          RAINBOW Hard Disk Utility Program (Version 0.16)
--------------------------------------------------------------------------------

                        Operating System Menu



Please select the operating systems to be used with the hard disk:


--->
     1.  CP/M-86/80 only

     2.  MS-DOS only

     3.  Both CP/M-86/80 and MS-DOS



For more information, press <Help>.
To point to a selection, press the up arrow key, down arrow key
     or a number key.
After pointing to a selection, press <Do> to advance to the next menu.
To quit and return to the Main Screen, press <Main Screen (F9)>.
```

Screen 45. The Operating System Menu

The example in Screens 46a through 47 displays the sequence based on the selection of the third option: Both CP/M-86/80 and MS-DOS. If you select the third option, there are two screens asking you to select the partition combination you want:

```
          RAINBOW Hard Disk Utility Program (Version 0.16)
------------------------------------------------------------------------------

          CP/M-86/80 & MS-DOS Partition Menu (Part 1)


Please select one of the following partition plans for the
CP/M-86/80 half of the hard disk:

--->
     1. One partition: 5 MBytes,

     2. Two partitions: 2.5 MBytes each



For more information, press <Help>.
To point to a selection, press the up arrow key, down arrow key
     or a number key.
After pointing to a selection, press <Do> to advance to the next menu.
To quit and return to the previous menu, press <Prev Screen>.
To quit and return to the Main Screen, press <Main Screen (F9)>.
```

Screen 46a. CP/M-86/80 Partition Menu

NOTE

If you have a disk with five megabytes instead of ten, the partition sizes shown on the screen are different.

To select an option, press the up or down arrow key, or type a number (1–2). Then press the Do key. The second screen is then displayed.

```
          RAINBOW Hard Disk Utility Program (Version 0.16)
--------------------------------------------------------------------------------

            CP/M-86/80 & MS-DOS Partition Menu (Part 2)


Please select one of the following partition plans for the
MS-DOS half of the hard disk:

--->
     1. One partition: 5 MBytes,

     2. Two partitions: 2.5 MBytes each



For more information, press <Help>.
To point to a selection, press the up arrow key, down arrow key
     or a number key.
After pointing to a selection, press <Do> to begin repartitioning.
To quit and return to the previous menu, press (Prev Screen>.
To quit and return to the Main Screen, press <Main Screen (F9)>.
```

Screen 46b. MS-DOS Partition Menu

To select an option, press the up or down arrow key, or type a number (1–2). Then press the Do key.

The available space is divided equally between the two operating systems.

From the menus, you can select the new partition arrangement. Then press the Do key to begin the repartitioning process.

When you press the Do key, you are given two warnings that:

```
ALL DATA ON THE HARD DISK WILL BE DESTROYED
```

Then the program assures you that:

```
Re-partitioning is in progress
```

followed by the new partition status. Screen 47 is a report of the status if you choose to have one partition for the CP/M-86/80 operating system, and two MS-DOS partitions.

```
          RAINBOW Hard Disk Utility Program (Version 0.16)
------------------------------------------------------------------------------



Re-partitioning is now completed.

The hard disk now has the following partitions:

Partition                    Operating
Name          Drive          System          Size
---------     -----          ---------       ----

CPM-1         E              CP/M-86/80      4.898MB
MSDOS-1       E              MS-DOS          2.449MB
MSDOS-2       F              MS-DOS          2.449MB


To perform additional actions, press <Main Screen (F9) to
    return to the Main Screen.
If finished with this program, insert a system diskette into Drive A
    and press <Set-Up> followed by <Ctrl/Set-Up>.
```

Screen 47. The Re-partitioned Disk Status

NOTE

If you have a disk with five megabytes instead of ten, the partition sizes shown on the screen are different.

Section 3
Copying Files to and from the Hard Disk

This section describes how to copy files to and from the hard disk onto a diskette. In this section, copying files from the hard disk is referred to as "backing up"; copying files back to the hard disk is referred to as "restoring".

On the CP/M-86/80 system diskette, there is a program called BACKUP, which you use to back up and restore files.

Why Save Files?

It is important to save or backup all files at regular intervals because a disk can become too full, damaged, or accidentally erased. By making back-up copies of the files, you can delete them from the daily working space on the disk, and restore them to the disk at a later time. The instructions below assume that you are starting the operating system from a diskette in drive A.

Using the BACKUP Program

To run the BACKUP program to either back up or restore files, you must have the CP/M-86/80 system diskette in drive A. In response to the prompt, A>, type:

A>BACKUP Return

The menu on the following page is displayed.

```
              RAINBOW Backup and Restore Utility (Version 1.0)
--------------------------------------------------------------------------------

                                  Main Screen

--->
     1.  Backup:  Copy hard disk files onto backup diskettes

     2.  Restore: Recopy files from backup diskettes onto hard disk

     3.  Verify:  Compare hard disk files to backup diskette files

     4.  Directory:  List the names of files on backup diskettes

     5.  Set the date and time

     6.  Exit from this program

To point to a selection, press the up arrow key, down arrow key or
     a number key.
On any line, press <Help> for information and instructions.
Press <Do> to begin the selected action.
```

Screen 48. The Backup/Restore Main Screen

In general, to select an option, press the up or down arrow keys, or type a number (1–6). For example, if you type the number 4, the arrow to the left at the top of the screen moves to the fourth option. Then press the Do key to start the option.

> **NOTE**
> If you are not sure what an option means, select the option and press the Help key. After you have received the information you need, press the Prev Screen key to return to the Main Screen.

After you press the Do key and the BACKUP program begins, you are prompted to insert a diskette. When that diskette is full, you are prompted to insert another diskette until all specified files have been copied.

Copying Files From the Hard Disk to Diskettes

Option 1 of the BACKUP program allows you to copy selected files from the hard disk to a set of diskettes, which are called the backup diskettes. Some or all of these files may be copied back to the hard disk at any time with the restore option of the BACKUP program.

When you select Option 1, you are requested to identify the source and destination drives, and the type of files you want to save. (See Screen 49.)

```
                RAINBOW Backup and Restore Utility (Version 1.0)
------------------------------------------------------------------------------

                              Standard Backup Options

--->

     Source hard disk drive.......... [none] E  F  G  H  I  J  K

     Destination diskette drive...... [none] A  B  C  D

     Type of files to save........... [All]  Changed



Brackets surround selected options.
To point to a line, press the up arrow key or down arrow key.
On any line, press <Help> for information and instructions.
When all options are set as desired, press <Do> to begin the backup.
To see Advanced User Backup Options, press <Next Screen>.
To quit and return to Main Screen, press <Main Screen (F9)>.
```

Screen 49. Standard Backup Options

To specify the required information:

1. Press the up or down arrow key to select a line
2. Press the right arrow key to select an option within a line. As noted at the bottom of Screen 49, square brackets surround each selected option. Each time you press the right arrow key, the brackets move one option to the right
3. When all selections have been made, press the Do key

As BACKUP is copying the files, each file name is displayed on the screen. When the program is done, it displays a brief message indicating that the back-up procedure has completed, and the program returns to the BACKUP Main Screen.

> **NOTE**
> After files have been copied on diskettes, you cannot use the files for any operation other than restore.

If the date and time have not previously been set on the computer, you are requested to do that at this time, as described in the next section. If the date and time have been set, proceed to the section called "ADVANCED BACKUP PROCEDURES".

Setting the Date and Time on Backup Diskettes. Before a backup operation can be done, the date and time must be set on the computer. If it has not been set using the DATE command (at the operating system level), when you use BACKUP, the following screen is displayed:

```
              RAINBOW Backup and Restore Utility (Version 1.0)
--------------------------------------------------------------------------------

                                  Date and Time

Please enter the current date and time.

Date format: dd-mon-yy
   Examples: 23-Jan-85, 8-May-84

Time format: hh:mm:ss
   Examples: 16:34:56, 1:45:33
--->

     Today's date.....----------

     Current time.....----------


To point to a line, press the up arrow key or down arrow key.
On any line, press <Help> for information and instructions.
When all options are set as desired, press <Do> to set the clock.
To quit and return to Main Screen; press <Main Screen (F9)>.
```

Screen 50. Date and Time

Enter the current date and time on the drawn lines in the following format as shown in Screen 50:

1. The name of the month can be entered in uppercase or lowercase characters
2. The day and year can be from one to four digits
3. The hours, minutes, and seconds can each be entered as one to four digits. Specifying the seconds is optional. The default value is zero.

Press the Do key to set the clock.

If values already exist for the date and time, you can remove them by pressing the delete character key. Then enter the current date and time as described.

If you wish to change the date and time that has already been set, choose Option 5: Set the date and time from the Main Screen.

Advanced Backup Procedures. The directions at the bottom of the Standard Backup Options screen include pressing the Next Screen key. If you do this, you are given more options for the back-up operation, as shown in Screen 51.

```
                RAINBOW Backup and Restore Utility (Version 1.0)
------------------------------------------------------------------------------

                          Advanced User Backup Options

--->
     Source hard disk drive.............. [none] E F G H I J K
     Destination diskette drive......... [none] A B C D
     Type of files to save.............. [All]  Changed

     Backup file specifier...................... *.*
     Backup exclusion file specifier........... ----------
     Name for backup diskettes.................. BACKUP
     Exclude system files from backup........... [No]  Yes
     Exclude Read-Only files from backup........ [No]  Yes
     Delete files after backup.................. [No]  Yes
     Verify files after backup.................. [No]  Yes
     Get confirmation before deletes.............  No  [Yes]
To point to a line, press the up arrow key or down arrow key.
On any line, press <Help> for information and instructions.
When all options are set as desired, press <Do> to begin the backup.
To quit and return to Standard Backup Options, press <Prev Screen>.
To quit and return to Main Screen, press <Main Screen (F9)>.
```

Screen 51. Advanced User Backup Options

To specify the required information:

1. Press the up or down arrow key to select a line
2. Press the right arrow key to select an option within a line, or type a value on the drawn line
3. When all information has been specified, press the Do key

As BACKUP is copying the files, each file name is displayed on the screen. When the program is done, it displays a brief message indicating that the back-up procedure has completed, and the program returns to the BACKUP Main Screen.

> **NOTE**
> After files have been copied on diskettes, you cannot use the files for any operation other than restore.

The advanced backup options are described on the following pages.

Source hard-disk drive

This option allows you to specify the partition on the hard disk from which files will be saved. The partitions recognized by this program range from E to K. If a hard disk has fewer partitions, and you select a nonexistant partition, a message is displayed on the bottom of the screen in reverse video. There is no default value; you must select a partition.

Destination diskette drive

This option allows you to specify which diskette drive contains the backup diskettes. The option requests that you insert diskettes as needed to save all the specified files.

The drives recognized by this program range from A to D. There is no default value; you must select a drive.

Type of files to save

This option allows you to specify whether or not to save ALL files or just those that have been changed or created since the last back-up procedure. The default is to back up all files. However, saving selected files is faster and requires less space.

Backup file specifier

This option allows you to specify categories of file names to be saved on the backup diskette. The names of the files to be saved can be written in this entry by using:

- A one to eight-character file name
- An optional period (.)
- An optional file type of up to three characters

If desired, you can also use the following wildcard characters:

?	Matches any single character
*	Matches any number of any characters, including a blank

You can also specify an indirect file. An indirect file contains a list of files (one per line) to be saved on the backup diskettes. This is useful if you have a long and frequently used list of files.

To specify an indirect file:

1. Use the symbol <
2. Followed by an optional drive name (A through P)
3. Followed by a file name and optional file type. The name of the indirect file cannot include wildcard characters. However, the file names listed in the indirect file can contain wildcards.

Example:

<A:LIST.FIL

If you type an illegal character, a message is displayed at the bottom of the screen. If you type a character unintentionally, you can use the delete character key to erase the character.

The default backup file specifier is all files (*.*).

Backup exclusion file specifier

This option allows you to specify a category of file names *not* to be saved on the backup diskettes. The names of the files *not* to be saved can be written in this entry by using the wildcard characters described earlier. The default is no files. If you type an illegal character, a message is displayed at the bottom of the screen. If you type a character unintentionally, you can use the delete character key to erase the character.

Name for backup diskettes

The name of the backup diskettes is an eight-character name that you choose. This name is stored on each backup diskette in the set. The name is also used by the restore and verify programs as a check that the correct set of diskettes has been inserted when files are being copied back to the hard disk. The default name is BACKUP. To change the name, erase the existing name using the delete character key. Then re-type the name. If you type an illegal character, a message is displayed at the bottom of the screen. If you type a character unintentionally, you can use the delete character key to erase the character.

Exclude System files from backup

This option allows you to specify whether or not to save files with the system attribute that are in the source partition. (Files with system attributes are files that you have stored in the system directory. Refer to Chapter 2 of this guide for more information about attributes and directories.) The system files are not often changed so that once you have saved them, you can choose not to save them again. The default is NO.

Exclude Read Only files from backup

This option allows you to specify whether or not to save files with the Read Only attribute that are in the source partition. The default is NO.

Delete files after backup

This option allows you to specify whether or not to delete each file from the hard disk source partition after the file has been saved onto the backup diskettes. This selection can save you time if a large number of files are to be permanently saved. In addition, this option eliminates the possibility of deleting the wrong files after a permanent back-up procedure. The default is NO.

Verify files after backup

This option allows you to specify whether or not to check that the data has been correctly copied to the backup diskettes. This feature verifies that the data has been properly copied. On the other hand, it takes more time. Therefore, if you feel confident about the back-up procedures, select NO for this option. The default is NO.

Get confirmation before deletes

This option allows you to specify whether or not to require you to "give permission" before any data is deleted from the hard disk or backup diskettes. Typical messages remind you that all prior data on the backup diskettes will be destroyed, and that files on the hard disk will be deleted (if delete after backup has been selected). You are also prompted before each file deletion whether or not to delete that particular file. If you feel confident about the operation of the back-up procedure and do not wish to be prompted by these messages, select NO for this option. The default is YES.

Copying Files from Diskettes to the Hard Disk

Option 2 from the BACKUP Main Screen allows you to copy selected files from the backup diskettes to a specified partition on the hard disk. This is generally done to recover files that were accidentally erased from the hard disk.

To start the restore option, select Option 2 from the BACKUP Main Screen shown in Screen 48. When you select this option, you are requested to identify the source and destination drives, and the files you want to restore. (See Screen 52.)

```
                RAINBOW Backup and Restore Utility (Version 1.0)
------------------------------------------------------------------------------

                            Standard Restore Options

 --->

     Source diskette drive..... [none] A B C D

     Destination hard disk drive.... [none] E F G H I J K

     Restore file specifier..... * *



Brackets surround selected options.
To point to a line, press the up arrow key or down arrow key.
On any line, press <Help> for information and instructions.
When all options are set as desired, press <Do> to begin the restore.
To see Advanced User Restore Options, press <Next Screen>.
To quit and return to Main Screen, press <Main Screen (F9)>.
```

Screen 52. Standard Restore Options

NOTE
The *.* indicates all files.

To specify the required information:

1. Press the up or down arrow key to select a line
2. Press the right arrow key to select an option within a line, or type a value on the drawn line
3. When all selections have been made, press the Do key

As BACKUP is restoring the files, each file name is displayed on the screen. When the program is done, it displays a brief message indicating that the restore procedure has completed, and the program returns to the BACKUP Main Screen.

Advanced Restore Options. The directions at the bottom of the Standard Restore Options screen include pressing the Next Screen key. If you do this, you are given more options for the restore program as shown in screen 53.

```
              RAINBOW Backup and Restore Utility (Version 1.0)
--------------------------------------------------------------------------------

                        Advanced User Restore Options

--->
     Source diskette drive..... [none] A B C D
     Destination hard disk drive.... [none] E F G H I J K

     Restore file specifier..... *.*
     Restore exclusion file specifier... -----------
     Name of backup diskettes..... BACKUP

     Restore over existing files.....   No  [Yes]
     Restore over Read-Only files.....   No  [Yes]
     Restore over system files.....   No  [Yes]
     Verify files after restore..... [No]  Yes
     Get confirmation before deletes.....   No  [Yes]
To point to a line, press the up arrow key or down arrow key.
On any line, press <Help> for information and instructions.
When all options are set as desired, press <Do> to begin the restore.
To quit and return to Standard Restore Options, press <Prev Screen>.
To quit and return to Main Screen, press <Main Screen (F9)>.
```

Screen 53. Advanced User Restore Options

To specify the required information:

1. Press the up or down arrow key to select a line
2. Press the right arrow key to select an option within a line, or type a value on the drawn line
3. When all information has been specified, press the Do key

As BACKUP is restoring the files, each file name is displayed on the screen. When the program is done, it displays a brief message indicating that the restore procedure has completed, and the program returns to the BACKUP Main Screen.

These options are similar to those for the backup options, except for three, which are described on the next page.

Restore over existing files

This option allows you to specify whether or not to restore files from the backup diskettes even if a file of the same name already exists on the hard disk. If the file already exists on the hard disk, it is deleted and the file from the diskette is written onto the hard disk.

The option is useful if you wish to restore a few files that were inadvertently deleted. The default is YES.

Restore over Read Only files

This option allows you to specify whether or not to restore files that have a Read Only protection attribute from the backup diskettes even if a file of the same name already exists on the hard disk. If the file already exists on the hard disk, it is deleted and the file from the diskette is written onto the hard disk.

This option, in effect, allows the Restore utility to override the Read Only attribute. The default is YES.

Restore over system files

This option allows you to specify whether or not to restore system files from the backup diskettes even if a file of the same name already exists on the hard disk. If the file already exists on the hard disk, it is deleted and the file from the diskette is written onto the hard disk.

This option is useful if you wish to restore all application files to a previous state. The default is YES.

Comparing Files after Copying to Hard Disk

Option 3 of the BACKUP program allows you to compare specified files on the backup diskettes with the corresponding files on the hard disk. This option can be used to indicate any changes that have been made since a file was last saved. The verify option is useful as a check that you have the latest copy of any given file, as well as a check to be sure you have saved the file on diskettes.

To start the verify option, select Option 3 from the BACKUP Main Screen shown in Screen 48. When you select this option, you are requested to identify the diskette and hard disk drives, and the files you want to verify. (See Screen 54.)

```
                RAINBOW Backup and Restore Utility (Version 1.0)
------------------------------------------------------------------------------

                            Standard Verify Options

 --->

     Compare  diskette drive..... [none] A B C D

     Compare hard disk drive..... [none] E F G H I J K

     Compare file specifier..... *.*



Brackets surround selected options.
To point to a line, press the up arrow key or down arrow key.
On any line, press <Help> for information and instructions.
When all options are set as desired, press <Do> to begin the verify.
To see Advanced User Verify Options, press <Next Screen>.
To quit and return to Main Screen, press <Main Screen (F9)>.
```

Screen 54. Standard Verify Options

To specify the required information:

1. Press the up or down arrow key to select a line
2. Press the right arrow key to select an option within a line, or type a value on the drawn line
3. Then press the Do key

As BACKUP verifies each file, the file name is displayed on the screen. When the program is done, you see a brief message indicating that the verify procedure has completed, and the program returns to the Main Screen.

The verify options are similar to the backup and restore options as described on preceding pages.

Listing File Names on Backup Diskettes

Option 4 of the BACKUP program allows you to list the names of all files that were saved on a set of backup diskettes.

To start the directory option, select Option 4 from the BACKUP Main Screen shown in Screen 48. When you select this option, you see the options as shown in Screen 55.

```
              RAINBOW Backup and Restore Utility (Version 1.0)
--------------------------------------------------------------------------------

                              Directory Options



--->

     Source diskette drive [none] A B C D



Brackets surround selected options.
To point to a line, press the up arrow key or down arrow key.
On any line, press <Help> for information and instructions.
When all options are set as desired, press <Do> to read the directory.
To quit and return to Main Screen, press <Main Screen (F9)>.
```

Screen 55. Directory Options

After you specify a drive, the program displays information about backup diskettes and the files on these diskettes.

As BACKUP reads each diskette, you are requested to insert another backup diskette from the set into the source drive until the complete directory is read.

A Short Cut to the Backup and Restore Options

If you know which of the first four options you want to run without displaying the Main Screen, you can type any of the following commands:

> **NOTE**
> The following examples assume drive A to be the active drive.

```
A>BACKUP [BACKUP] p:[filename.typ] TO drv: [/ALL] [/CHANGED] Return

A>BACKUP RESTORE p: FROM drv:[filename.typ] Return

A>BACKUP VERIFY p: WITH drv:[filename.typ] Return

A>BACKUP DIRECTORY drv: Return
```

Where:

p:	Is a hard disk partition (E through K)
drv:	Is a diskette drive (A through D)
[filename.typ]	Is an optional file specifier or indirect file (explained later in this section)
[/ALL]	Is an optional specification to back up all files
[/CHANGED]	Is an optional specification to back up only the files that have changed since the last backup.

Leaving the BACKUP Program

Option 6 from the BACKUP Main Screen allows you to leave the BACKUP program, and return to the Utility Program Main Screen. To select Option 6, press the down arrow key until the displayed arrow reaches the sixth option, or type the number 6. Then press the Do key.

Section 4
Recovering from Hard Disk Problems

This section describes problems you might encounter while initializing or repartitioning the hard disk, or while running programs on the disk.

Detecting Operation Problems

Segments of storage space are called sectors. There are two instances when sector problems may be detected during normal operation:

1. When reading a previously written file
2. When a new file is being written

If a problem occurs, the program cannot read or cannot write the file, and the following message is displayed:

```
Read error on drive drv:, track nn, sector nn
```

or

```
Write error on drv:, track nn, sector nn
```

Recovering from an Operation Problem

When you see the READ ERROR or WRITE ERROR message, run the program called RECOVER, found on the utility diskette. The RECOVER program assigns an alternate sector and copies the data into the good sector, ignoring the problem. The program then informs you that the file is now readable. The file, however, may contain modified data or data may have been lost.

RECOVER requires that you specify the hard disk drive name where the file is located. For example,

```
A> RECOVER E: Return
```

If you type:

```
A> RECOVER Return
```

you are prompted for the drive name where the file is located.

Detecting Initialization or Repartitioning Problems

During the initialization or repartitioning process, problems may be found on sectors. If problems are found on sectors, alternate sectors are automatically assigned, and the problem sectors are ignored.

If you see a message that begins with:

FATAL ERROR

The entire disk is unusable. However, if you see a message that begins with:

ERROR IN PARTITION drv:

only the specified partition is unusable, and you can continue with other partitions.

Recovering from an Installation Problem

To run the diagnostic test and re-initialize the disk if you have encountered frequent problems, first, return to the Main Screen on the utility diskette, and select Option 4.

Option 4: Run the hard disk diagnostic

This option runs the same diagnostic test as you ran to initialize the disk (Option 1, described in the *Rainbow Winchester Disk Option Installation Guide*). However, Option 4 should be run if a problem was detected while running Option 1. Unlike Option 1, Option 4 displays detailed messages as it runs eight subtests. As each subtest runs, the program displays either:

PASSED

or

FAILED

Screen 56 shows the end of a diagnostic test during which no problems were detected.

```
            RAINBOW Hard Disk Utility Program (Version 0.16)
--------------------------------------------------------------------------------

                        HARD DISK OPTION DIAGNOSTIC              REV. 1.1

................................................................................
                                              PASS 0000
                READ ALL SECTORS              PASSED
SUBTEST #7:     WRITE SECTORS TEST
                IMPLIED SEEK(WRITE)           PASSED
                BASIC WRITE TEST 1            PASSED
                BASIC WRITE TEST 2            PASSED
                BASIC WRITE TEST 3            PASSED
SUBTEST #8:     WRITE FORMAT TESTS            PASSED

 *** DIAGNOSTIC COMPLETE ***

PRESS <Return> TO RETURN TO MAIN MENU

................................................................................
```

Screen 56. End of a Diagnostic Test

If Option 4 encounters new bad sectors during initialization, when Option 4 finishes, you see the following message:

```
n NEW BAD SECTORS DETECTED
SELECT THE RE-INITIIALIZE OPTION
```

If you see this message, return to the Main Screen, back up your files, then run Option 5 to re-initialize the disk.

Option 5: Re-initialize the hard disk

This procedure is the same as option 1 except it does not run the diagnostic test.

You select Option 5 if problems have been found on partitions after you run the diagnostic test (Option 4). Re-initialization is like beginning again with a new disk. If any information was previously stored on the disk, it will be erased.

If the number of bad sectors within a partition is less than the maximum allowed, the bad sectors are recorded in an internal table and are no longer used by the operating system. You can then restore the files back to the hard disk, minus the bad sectors.

If the number of bad sectors exceeds the maximum allowed, the partition cannot be used, and the following message is displayed:

```
ERROR IN PARTITION drv:
Too many bad sectors
```

Appendixes

A
Diskettes

Flexible diskettes, when used with care, are remarkably durable and reliable storage devices. Any given portion of a diskette's surface can be read and written upon millions of times before the oxide film that holds the data begins to wear too thin to consistently hold data. Moreover, flexible diskettes routinely pass, without a single problem, diagnostic tests. These tests fill the diskettes' tracks with data, which is checked, changed, and rewritten in worst-case format, over and over.

In spite of their ruggedness and reliability, flexible diskettes (sometimes called "floppies") have acquired a somewhat poor reputation in data processing circles.

There are several reasons for this reputation. For example, diskettes are often placed on top of video terminals where they are exposed to heat and magnetic fields, placed beneath coffee cups and cold drink cans, and even left on the floor without their protective envelopes.

In spite of such treatment, many diskettes continue to work for months or years at a time. However, to avoid potential disaster, observe the following precautions.

Storing Diskettes

- Keep flexible diskettes in close-fitting, dust-tight boxes (like those they are packaged in when you buy them ten at a time).
- Store these boxes in rooms with consistent temperature, humidity, and cleanliness.

Handling Diskettes

Follow the tips below when handling diskettes.

- Avoid bending the diskettes. The "flexibility" of flexible diskettes is an accident of their design, not a goal. They will bend, but when bent their covers tend to crease or warp in ways that cause wear and binding when the drives rotate the diskette inside. Insert diskettes *gently* into their drives.
- Never allow your fingers to touch the diskette data surface (that is, the shiny, usually brown or black surface inside the black cover). Body oils cause the drive read/write heads (small electromagnets used to read or write information) to behave erratically, usually at the cost of data.
- Always return diskettes to their protective paper envelopes, even if you expect to use them again in a few seconds. One piece of grit on a diskette picked up from a desk top can wipe out a week's work.
- Keep diskettes far away from magnets. Magnets are often used to hold notes and pictures to metal surfaces. These handy items can damage diskettes.
- The best place to store diskettes, even temporarily, is in their storage boxes. Otherwise, keep them in their protective paper envelopes and never lay *anything* on top of them. Once you cover a diskette with a memo, the next thing you lay down will inevitably be a magnetized paperweight, stapler, or a key ring.

Using Diskettes

- Always identify your diskettes with the self-sticking labels. (You can always ask the computer to tell you what is on the diskette.) If you fill out these labels after they are applied to the diskette cover, use only felt-tip pens because they require minimum pressure. **Never** use a ball-point pen or pencil. They can seriously damage both the diskette cover and the diskette inside.

  If you place a new label on a diskette, be sure to gently peel off the old label first. Placing labels on top of labels can cause the diskette to be seated improperly in a drive.

- Never allow diskettes to become so full that you risk running out of space while trying to write data to them. Leave some free space on your data diskettes.

- When running application programs that write data to diskettes, do not exchange one diskette for another except when the program tells you to do so or has finished executing. Some programs open files and leave them open until all the required data has been entered and acted upon. You almost certainly will have trouble if you exchange diskettes in the middle of such an operation. Reinitialize the operating system by typing Ctrl/C after inserting a diskette into a drive that has just been used for writing data. This will ensure that the operating system has initialized all its internal diskette pointers.

- Do not turn the computer's power on or off when a diskette is inserted into any drive.

Diskette Back-up Procedures

These procedures involve making copies of any edited diskettes. It is important to make copies of all diskettes because the originals can be lost or damaged. For example, sliding a diskette in and out of its jacket or a drive can wear it out.

Follow these tips and protect your work.

- Make copies of original diskettes. Label the original "master" and store it. You might want to make two copies of the original.

- Set up a diskette rotation method. Use five diskettes. At the close of day one, copy diskette work onto day two's diskette. At the close of day two, copy work onto day three's diskette. Label diskettes with the numbers, actual dates, or days of the week.
- Take diskettes out of use after six months of rotation.

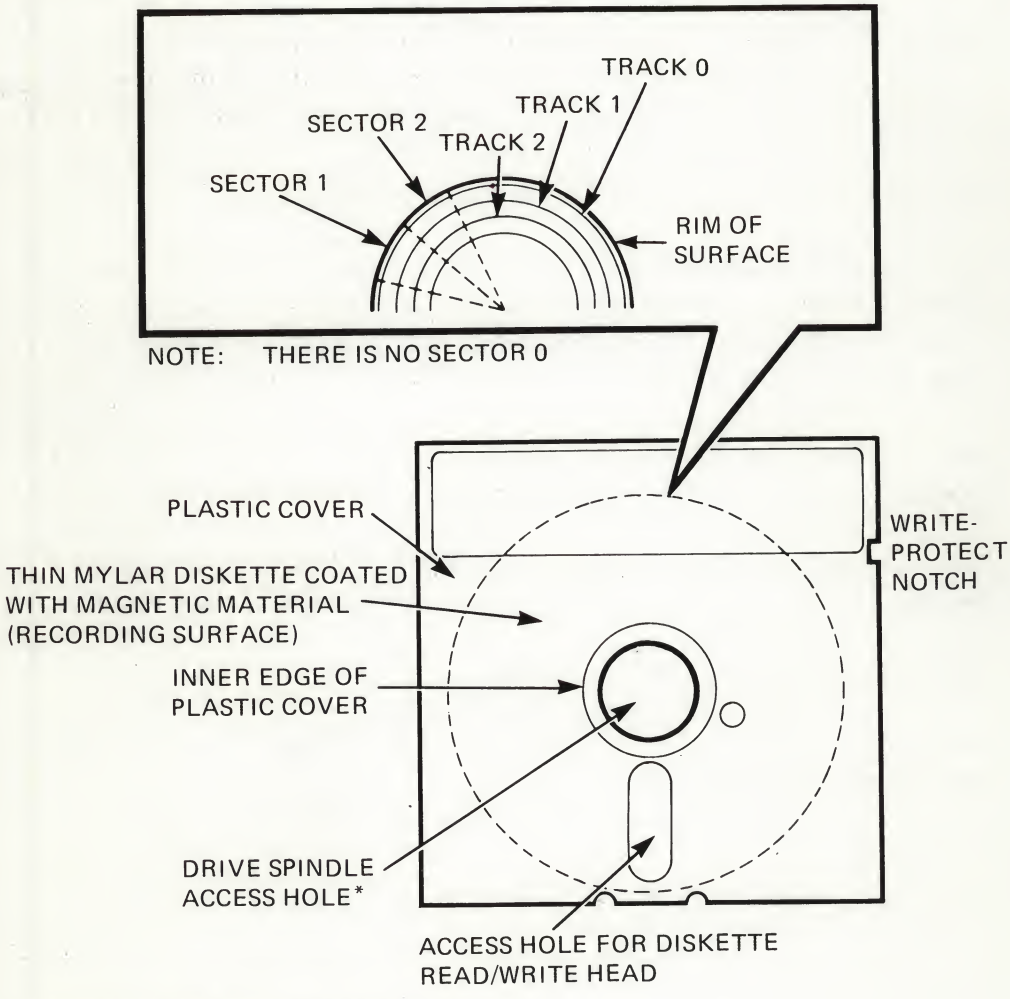
Above all "better safe than sorry." Months of work can be lost due to worn-out or damaged diskettes.

Diskettes and Files

The CP/M-86/80 operating system deals with a wide range of information including programs, text, and data. Information is organized in the form of files, and the files are stored on diskettes. File names distinguish electronic files much the same way as labels on file folders distinguish paper files in a cabinet.

Storing Information on Diskettes

The computer stores and retrieves files by referring to tracks and sectors on a diskette (see Figure 12).



* ROTATING SPINDLE ENTERS THIS HOLE, GRABS DISKETTE, AND SPINS IT.

Figure 12. Tracks and Sectors on a diskette

Rainbow diskettes have 80 tracks, (numbered 0–79); each track is composed of ten sectors. Sectors store blocks of "bytes;" each byte represents one character such as a letter, a digit, or a symbol. Because each sector has a unique location on a diskette, the computer can find a particular sector on a particular track and store information in it or retrieve information from it.

The amount of information you can store on a diskette depends on the diskette's "density." The Rainbow's double density diskettes can hold twice as much information as single density diskettes. You can store about 150 pages of typewritten text on one diskette assuming 54 lines per page and 65 characters per line.

Protecting Information on Diskettes

You can protect the data on a diskette from being accidentally deleted by applying a self-sticking write-protect tab onto the diskette's write-protect notch. (See Figure 13).

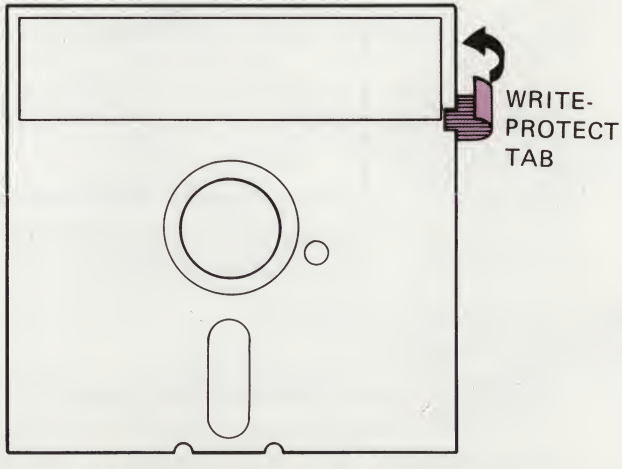


Figure 13. Applying a Write-Protect Tab

This tab prevents the computer from writing on the diskette. You can remove the write-protect tab by peeling it off the diskette when you want the computer to write on it.

NOTE
You can purchase write-protect tabs at any computer store.

B

Operating System Messages

What is in this Appendix

This appendix lists the messages that can be displayed while you are starting or using the CP/M-86/80 operating system.

As a general rule, *if a message(s) is displayed, RETRY the command or procedure a few times.* Messages are most often due to mistyping a command, or omitting part of a command line. If the message persists, refer to the list of messages and possible corrective action. Peform the suggested corrective action and then RETRY the procedure.

If you see a message that starts with

```
See Owner's Manual - MESSAGE nn -
```

Consult the *Rainbow Owner's Manual.*

If a message is displayed while you are using an application, refer to the user's guide supplied with that program. For a fast reference to the operating system messages, Table 14 alphabetically lists each message in this appendix, the source of the message, and the page where you can find it.

> **NOTE**
> Under the "Source" column, O.S. refers to the operating system.

Table 14. List of Messages and Their Source

Message	Source	Page
Aborted	O.S.	262
Bad Directory on drv:	STAT	263
BDOS Err on A: FILE R/O Type any key to exit.	O.S.	263
BDOS Err on A: R/O Type any key to exit.	O.S.	264
BDOS Err on A: SELECT Type any key to exit.	O.S.	264
Cannot find RED MASTER DISKETTE	RED	265
Cannot load .COM file	O.S.	265
Cannot run .COM file on 64K system	O.S.	265
Command too long	SUBMIT	266
DESTINATION DISKETTE FORMAT IS INCORRECT	DISKCOPY	266
DESTINATION DISKETTE IS NOT RX50K FORMAT	DISKCOPY	266
DESTINATION IS R/O, DELETE (Y/N)?	PIP	266
Drive not ready – drv:	O.S.	267
DRIVE NOT READY - DOOR OPEN OR NO DISKETTE IN DRIVE	FORMAT	268
DRIVE NOT READY. Try another? (Y/N)	DISKCOPY	269

Table 14. List of Messages and Their Source (cont.)

Message	Source	Page
DRIVE SPEED OUT OF RANGE - DRIVE CANNOT BE USED FOR FORMATTING	FORMAT	270
Drive write-protected – drv:	O.S.	270
ERROR: BAD PARAMETER	PIP	271
ERROR: CLOSE FILE - [drv:filename.typ]	PIP	272
ERROR: DISKETTE READ - [drv:filename.typ]	PIP	272
ERROR: DISKETTE WRITE - [drv:filename.typ]	PIP	273
ERROR: FILE NOT FOUND - [drv:filename.typ]	PIP	273
ERROR: HEX RECORD CHECKSUM - [drv:filename.typ]	PIP	274
ERROR IN PARTITION drv: Initialization data could not be written	hard disk utility prog.	274
ERROR IN PARTITION drv: Too many bad sectors	hard disk utility prog.	275
ERROR: INVALID DESTINATION	PIP	275
ERROR: INVALID FORMAT - [drv:filename.typ]	PIP	275
ERROR: INVALID HEX DIGIT - [drv:filename.typ]	PIP	276
ERROR: INVALID SEPARATOR - [drv:filename.typ]	PIP	276
ERROR: INVALID SOURCE	PIP	276
ERROR: INVALID USER NUMBER	PIP	277
ERROR: NO DIRECTORY SPACE - [drv:filename.typ]	PIP	277
ERROR: QUIT NOT FOUND	PIP	277
ERROR: START NOT FOUND	PIP	278

Table 14. List of Messages and Their Source (cont.)

Message	Source	Page
ERROR: UNEXPECTED END OF HEX FILE - [drv:filename.typ]	PIP	278
ERROR: USER ABORTED	PIP	278
ERROR: VERIFY - [drv:filename.typ]	PIP	279
Error on Line nnn Diskette Write Error	SUBMIT	279
Error on Line nnn Parameter Error	SUBMIT	279
Error on Line nnn No 'SUB' File Present	SUBMIT	280
FATAL ERROR Hardware failure detected during testing	hard disk utility prog.	280
FATAL ERROR Hard disk does not respond	hard disk utility prog.	280
FATAL ERROR Initialization data could not be read from hard disk	hard disk utility prog.	281
FATAL ERROR Initialization data could not be written on hard disk	hard disk utility prog.	281
FATAL ERROR No hard disk diagnostic program	hard disk utility prog.	281
FATAL ERROR No pre-boot program	hard disk utility prog.	282
FATAL ERROR No secondary boot program	hard disk utility prog.	282
FATAL ERROR Programming error occurred	hard disk utility prog.	282
FATAL ERROR Secondary boot program is too big	hard disk utility prog.	282
FILE EXISTS	REN	283
File Not Found	STAT	283
Hard disk option is not connected	hard disk utility prog.	284

Table 14. List of Messages and Their Source (cont.)

Message	Source	Page
Invalid Assignment	STAT	284
Invalid Assignment Use: STAT drv:=RO	STAT	284
Invalid Assignment Use: STAT drv:filename.typ [size] [ro] [rw] [sys] or [dir]	STAT	285
MEMORY NOT AVAILABLE	O.S.	286
nn?	USER	286
NO FILE	DIR	286
NON-SYSTEM FILE(S) EXIST	DIRS	287
Read error	TYPE	287
Read error on drive drv:, track nn, sector nn	O.S.	288
READ ERROR. Try another? (Y/N)	DISKCOPY	289
READ ERROR - UNABLE TO READ ALL DISK SECTORS	FORMAT	289
RED ERROR: Bad syntax on line Try RED NEWNAME [=] [OLDNAME] [/W]	RED	290
RED ERROR: Cannot edit read-only file	RED	290
RED ERROR: Illegal character on line, do not use , < > ; ? [ ] *	RED	290
RED ERROR: PLEASE ENTER "RED" FOLLOWED BY A FILE NAME	RED	291
Rename error: File "filename.ext" already exists	MAINT	291
Seek error on drive drv:, track nn	O.S.	291
SORRY CANNOT OPEN DOCUMENT	RED	293
SOURCE DISKETTE FORMAT IS INCORRECT	DISKCOPY	293
SOURCE DISKETTE IS NOT RX50K FORMAT	DISKCOPY	293

Table 14. List of Messages and Their Source (cont.)

Message	Source	Page
SYSTEM FILE(S) EXIST	DIR	293
The file CPM.SYS not found on this disk Do a system reset with a new disk	O.S.	294
The file Z80CNF.SYS cannot be loaded	O.S.	294
The file Z80CNF.SYS cannot be found on the System Disk	O.S.	295
The start of partition drv: was moved	hard disk utility prog.	295
Topic Not Found	HELP	295
WARNING: Files may not be intact on drive drv:	O.S.	296
WARNING: The hard disk is not formatted or not partitioned	O.S.	296
WRITE ERROR: CANNOT FORMAT DISKETTE	FORMAT	297
Write error on drive drv:, track nn, sector nn	O.S.	297
WRITE ERROR. Try another? (Y/N)	DISKCOPY	298

Conventions Used

Table 15 lists the conventions used in the discussion of the messages.

Table 15. Message Conventions

Convention	Meaning
drv or drv:	Drive name (A through D, or E through H for hard disk)
nn	Track or sector number on a diskette; or a user number
nnn	Line number in a .SUB file (a file you create, containing CP/M-86/80 commands, used with SUBMIT)
filename	File name
.typ	File type
filespec	File specification, including the drive name, file name, and file type

When you are instructed to reinitialize the operating system, hold down the control key while you press the C key. Do this directly after the prompt. This action is symbolized by:

Ctrl/C

(If you have typed a command after the prompt, type Ctrl/X to erase the line back to the prompt.) Depending on the program being run when the message is displayed, you may have to type Ctrl/C two or three times to reinitialize the operating system. The indications that the operating system is being reinitialized are:

- The drive makes "clicking" sounds.
- The lights beside one or more drives turn on momentarily.

Messages

The following are the messages that can be displayed while using the CP/M-86/80 operating system. The message is printed first in large type, followed by what it means and what to do about it.

Aborted

Meaning. This message can be displayed if you stop a transient program, such as PIP. Refer to Chapter 2 of this guide for more information about transient programs.

If a CP/M-86/80 program cannot be loaded or run properly on a Rainbow computer that has additional memory, possibly the additional memory is not working properly.

Action. Try running the program again by retyping the command.

If the program still cannot be loaded or run properly, run the extended self-test program to check the optional memory. To run this test:

1. Remove the CP/M-86/80 application program diskette from the drive.
2. Reset the computer by pressing the Set-Up key followed by the Ctrl/Set-Up keys. Be sure the correct memory size is saved.
3. Insert a Rainbow diskette into drive A; if desired, you can insert a system diskette.
4. Press the S key in response to the Main System Menu.

If the self-test program detects a problem with the additional memory, the following message is displayed:

See Owner's Manual - MESSAGE 27 - Memory Board

If this message is displayed, turn the computer off and then on again. If the problem persists after several retries, replace the optional memory by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Appendix C of this guide.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide.* This guide is *not* included in the Rainbow System Kit.

Bad Directory on drv:
User nn filespec

Meaning. This message can be displayed if STAT finds more than one file sharing the same portion of the diskette. Refer to Chapter 2 of this guide for more information about the STAT command. The message is followed by a list of file specifications.

Action. Retry the procedure or reset the computer and then retry the procedure.

If the problem persists:

1. Erase the file(s) listed after the message.
2. Re-initialize the operating system.
3. Retry the procedure.

BDOS Err on A: File R/O
Type any key to exit

Meaning. This message can occur if the specified file is assigned the Read Only Attribute.

You may also see this message if you attempt to erase a diskette using the ERA command, and the diskette is assigned the Read Only Attribute.

Action.

1. Exit the program.
2. Assign the file the Read Write Attribute using the STAT or MAINT commands.
3. Retry the procedure.

Refer to Chapter 2 of this guide for more information about attributes and the ERA and MAINT commands.

BDOS Err on A: R/O
Type any key to exit

Meaning. This message can be displayed if you have assigned a Read Only attribute, using STAT, to protect your files. Refer to Chapter 2 of this guide for more information about attributes and the STAT command.

Action.

1. Exit the program.
2. Assign the drive the Read Write Attribute using the STAT command if the specified drive has been assigned the Read Only Attribute. This message *does not* mean that the diskette has a write-protect tab on it.
3. Then, retry the procedure.

BDOS Err on A; Select
Type any key to exit

Meaning. This message is usually displayed if you select a nonexistent drive.

Action.

1. Exit the program.
2. Select an existing drive if you selected a nonexistent drive.

3. Insert a Rainbow diskette into the drive if the diskette is formatted improperly.
4. Retry the procedure.

Cannot find RED MASTER DISKETTE

Meaning. This message can be displayed if you try to use RED from a drive other than the active drive. Refer to Chapter 3 of this guide for more information about the RED editor.

Action. Change diskette drives or use PIP to copy RED onto the diskette in the active drive. Refer to Chapter 2 of this guide for more information about the PIP command.

Cannot load .COM file

Meaning. This message can be displayed if there is not enough memory to store a CP/M-80 program.

Action. Type:

Ctrl/C

to re-initialize the operating system and then retry the procedure.

If the problem persists, the CP/M-80 program may be too large to store in memory. Check your application program's documentation for the size of the program. The computer's transient program area is approximately 60K bytes of memory on a computer with 128K bytes or more of memory.

Cannot run .COM file on 64K system

Meaning. This message can occur if you try to run a CP/M-80 base program on a computer with 64k bytes of memory.

Action. Run the program on a computer with 128K bytes or more of memory.

Command too long

Meaning. This message can be displayed if SUBMIT finds a command in the .SUB file that exceeds 125 characters. Refer to Chapter 2 of this guide for more information about the SUBMIT command.

Action.

1. Edit the .SUB file.
2. Shorten the command.
3. Retry the procedure.

DESTINATION DISKETTE IS INCORRECT

Meaning. This message can occur if the DISKCOPY program cannot determine the type of diskette in the destination drive. Refer to Chapter 2 of this guide for more information about DISKCOPY.

Action. Replace the diskette in the destination drive.

DESTINATION DISKETTE IS NOT RX50 FORMAT

Meaning. This message can occur while using DISKCOPY if you have a diskette with the wrong format in the destination drive. Refer to Chapter 2 of this guide for more information about the DISKCOPY program.

Action. Replace the diskette with one that has the proper format, or format the diskette currently in the drive. The re-run DISKCOPY.

DESTINATION IS R/O, DELETE (Y/N)?

Meaning. This message can be displayed if PIP tries to delete an existing file that has the Read Only Attribute. Refer to Chapter 2 of this guide for more information about the PIP command.

Action.

- Type Y to delete existing file.
- Type N to stop the copy.

Drive not ready - drv:
Type a number followed by Return
1. Retry operation.
2. Cancel program.
3. Ignore error and continue.
4. Proceed, returning error.
==>

Meaning. This message can occur if:

- The drive door is open
- There is no diskette in the drive, or the diskette is inserted incorrectly
- The specified drive does not exist (for example, if you specify drives C or D and you do not have a computer with four drives.

Action. Select one of the options by typing a number and pressing the Return key.

1. If you choose to retry the procedure, the operating system repeats the failed disk operation. If the conditions causing the message have cleared up, the operating system continues as though no message had occurred. If the conditions causing the message still exist, the message will be repeated.
2. If you choose to cancel the program, the operating system stops the current command or program process and returns you to the system prompt. If the operating system was in the process of writing files on the diskette when the message occurred, the files may be incomplete.

3. If you choose to ignore the error, the operating system continues with the command or program as if no error had occurred. Any data read or written after this will probably be incorrect and you should check the files when done.
4. If you choose to proceed, returning the error, the operating system returns the error condition to the command or program. The program in turn discontinues processing and the result is identical to option 2. Some applications may provide additional actions or messages.

If you return to the operating system:

- Close the drive door if it is open
- Insert a diskette into the drive
- Reinsert the diskette correctly into the drive if it is upside-down
- Reinsert the diskette correctly into the drive if it is not inserted fully
- Specify an existing drive name
- Then retry the procedure

DRIVE NOT READY - DOOR OPEN OR NO DISKETTE IN DRIVE

Meaning. This indicates either that:

- The drive door is open
- There is no diskette in the drive, or the diskette is inserted incorrectly
- The specified drive does not exist (for example, if you specify drives C or D and you do not have a computer with four drives.)

Action.

- Close the drive door if it is open
- Insert a diskette into the drive
- Reinsert the diskette correctly into the drive if it is upside-down

- Reinsert the diskette correctly into the drive if it is not inserted fully
- Specify an existing drive name

If you did not select the correct drive:

1. Type:

   Ctrl/C

   to return to the operating system prompt.
2. Retry the procedure selecting the correct drive.

DRIVE NOT READY. Try another? (Y/N)

Meaning. This message can be displayed by DISKCOPY if:

- There is no diskette in the drive.
- The diskette in the drive is upside-down.
- The diskette is not inserted fully in the drive.
- The drive door is not closed.

Refer to Chapter 2 of this guide for more information about the DISKCOPY command.

Action.

- Insert a diskette into the drive.
- Reinsert the diskette into the drive correctly.
- Close the drive door.

Then, press the Y key to retry the procedure.

If you want to exit the program, press the N key and then the Exit key.

DRIVE SPEED OUT OF RANGE - DRIVE CANNOT BE USED FOR FORMATTING

Meaning. This message can occur while formatting a diskette when tracks are being written on the diskette. If this message is displayed, diskettes formatted on that drive may be unusable on another drive.

You also see this message if the diskette drive is faulty.

Action. Select another drive for formatting. If the message persists replace the drive by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Appendix C of this guide.
- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide.* This guide is *not* included in the Rainbow System Kit.

Drive write-protected – drv:
Type a number followed by Return:
1. Retry option.
2. Cancel program execution.
3. Ignore error.
4. Proceed, returning error.

==>

Meaning. This message can be displayed if the operating system tries to write onto a diskette that has a write-protect tab on it.

Action. Select one of the options by typing a number and pressing the Return key.

1. If you choose to retry the procedure, the operating system repeats the failed disk operation. If the conditions causing the message have cleared up, the operating system continues as though no message had occurred. If the conditions causing the message still exist, the message will be repeated.
2. If you choose to cancel the program, the operating system stops the current command or program process and returns you to the system prompt. If the operating system was in the process of writing files on the diskette when the message occurred, the files may be incomplete.
3. If you choose to ignore the error, the operating system continues with the command or program as if no error had occurred. Any data read or written after this will probably be incorrect and you should check the files when done.
4. If you choose to proceed, returning the error, the operating system returns the error condition to the command or program. The program in turn discontinues processing and the result is identical to option 2. Some applications may provide additional actions or messages.

If you return to the operating system:

1. Remove the diskette from the drive.
2. Remove the write-protect tab from the write-protect notch.
3. Retry the operation.

ERROR: BAD PARAMETER

Meaning. This message can be displayed if PIP finds an illegal parameter included in the command. Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Retype the command using a valid parameter.

ERROR: CLOSE FILE - [drv:filename.typ]

Meaning. This message can be displayed if PIP cannot close the specified output file because:

- The diskette has a write-protect tab on it.
- The diskette resides in a drive with the Read Only Attribute.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action.

1. Remove the write-protect tab from the diskette and reinsert it into the drive if you want to write the file onto the diskette.
2. Assign the drive the Read Write Attribute by typing Ctrl/C or using STAT if you want to write the file onto the diskette.
3. Then, retype the command.

Refer to Chapter 2 of this guide for more information about the STAT command.

ERROR: DISKETTE READ - [drv:filename.typ]

Meaning. This message can be displayed if PIP cannot read the specified input file properly. This message is usually displayed because the file contains an unexpected end-of-file marker. An end-of-file marker is a code inserted into every text file that indicates where the text ends.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Use a debugging program to delete the end-of-file marker. Then retype the command.

ERROR: DISKETTE WRITE - [drv:filename.typ]

Meaning. This message can be displayed if PIP cannot write the specified output file onto the diskette. This message is usually displayed because the diskette is full of files.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Insert a diskette with free space on it to store the file or erase unnecessary files from the full diskette. Then, retype the command.

ERROR: FILE NOT FOUND - [drv:filename.typ]

Meaning. This message can be displayed by PIP if:

- The file is not found on the specified diskette.
- The file name or file type is mistyped.
- The period between the file name and the file type is omitted.
- The wrong drive is specified.
- The file type is omitted.
- Too few wildcards are used.
- The file being copied has the System Attribute and the [R] parameter is not used.
- The file is stored in another user number.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action.

- Insert the diskette containing the file and retype the command.
- Retype the command including the correct file name and file type.
- Retype the command including the period between the file name and file type.

- Retype the command including the correct drive.
- Retype the command including the file type.
- Retype the command including enough wildcards.
- Retype the command using the [R] parameter
- Specify the correct user number from which to copy.

ERROR: HEX RECORD CHECKSUM - [drv:filename.typ]

Meaning. This message can be displayed if PIP finds a hexadecimal checksum error during a hexadecimal file transfer while using the [H] parameter. (A checksum is a method of verifying that the hexadecimal file is copied correctly.)

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Repeat the procedure that generated the hexadecimal file, and retype the command.

ERROR IN PARTITION drv: Initialization data could not be written

Meaning. The operating system requires certain data to be written to the first two sectors of the partition. This message can occur if some of that data could not be written for any reason.

Refer to Chapter 6 of this guide for more information about partitioning a hard disk.

Action. Press the Resume key to advance to other partitions; others are still usable.

ERROR IN PARTITION drv: Too many bad sectors

Meaning. This message can occur if the hard disk partition contains more bad sectors than there are remaining alternate sectors.

Refer to Chapter 6 of this guide for more information about partitions on a hard disk.

Action. Press the Resume key to advance to other partitions; others are still usable.

ERROR: INVALID DESTINATION

Meaning. This message can be displayed if PIP finds an invalid destination in the command. This message usually is displayed because an input device is specified as a destination.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Retype the command with a valid destination.

ERROR: INVALID FORMAT - [drv:filename.typ]

Meaning. This message can be displayed if PIP finds an invalid format in the command. This message usually is displayed because:

- There is a blank space between the file specification and a parameter.
- The command, PIP, was typed while in program mode.
- The command line was typed with spelling errors.
- An incomplete command line was typed.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Retype the command correctly.

ERROR: INVALID HEX DIGIT - [drv:filename.typ]

Meaning. This message can be displayed if PIP finds an illegal hexadecimal digit while reading a hexadecimal file while using the [H] parameter.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Repeat the procedure that generated the hexadecimal file, and retype the command.

ERROR: INVALID SEPARATOR - [drv:filename.typ]

Meaning. This message can be displayed if:

- PIP finds an invalid character between input file names.
- The file name or file type contains an illegal character.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Retype the command using a comma to separate two or more input files.

ERROR: INVALID SOURCE

Meaning. This message can be displayed if PIP finds an invalid source. This message usually is displayed because an output device is specified as a source.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Retype the command with a valid source.

ERROR: INVALID USER NUMBER

Meaning. This message can be displayed if PIP finds an illegal user number in the command. Legal user numbers are 0 to 15.

Refer to Chapter 2 of this guide for more information about the PIP command and user numbers.

Action. Retype the command using a legal user number.

ERROR: NO DIRECTORY SPACE - [drv:filename.typ]

Meaning. This message can be displayed if PIP cannot write a file onto a diskette due to insufficient directory space. Diskette directories can hold 128 file names. PIP usually displays this message if the diskette contains many small files.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Insert another diskette with free space on it or erase unnecessary files from the diskette. Then, retype the command.

ERROR: QUIT NOT FOUND

Meaning. This message can be displayed if PIP cannot find the specified "quit" string in the source file while using the [Q] parameter.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Retype the command using a valid string.

ERROR: START NOT FOUND

Meaning. This message can be displayed if PIP cannot find the specified "start" string in the source file while using the [S] parameter.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Retype the command using a valid string.

ERROR: UNEXPECTED END OF HEX FILE - [drv:filename.typ]

Meaning. This message can be displayed if PIP finds an end-of-file marker before the hexadecimal record is ended while using the [H] parameter. An end-of-file marker is a code inserted into a hexadecimal file that indicates where a hexadecimal record ends.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Repeat the procedure that generated the hexadecimal file and retype the command.

ERROR: USER ABORTED

Meaning. This message can be displayed if you stop a PIP command.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Retype the command.

ERROR: VERIFY - [drv:filename.typ]

Meaning. This message can be displayed if PIP finds a difference between the source and destination files while using the [V] parameter. Usually this indicates a destination diskette failure.

Refer to Chapter 2 of this guide for more information about the PIP command.

Action. Insert another destination diskette, and retype the command.

Error On Line nnn Diskette Write Error

Meaning. This message can be displayed if SUBMIT cannot create a temporary $$$.SUB file on the diskette that the operating system was started from. This message usually is displayed if you have a full diskette, or if the operating system diskette has a write-protect tab on the write-protect notch.

Refer to Chapter 2 of this guide for more information about the SUBMIT command.

Action. Insert another diskette with free space on it or erase unnecessary files from the full diskette, and retype the command.

Error On Line nnn Parameter Error

Meaning. This message can be displayed if SUBMIT finds invalid place holders in the .SUB file. For example, you may have typed 1$ rather than $1 in the .SUB file.

Refer to Chapter 2 of this guide for more information about the SUBMIT command.

Action. Edit the .SUB file, correct the problem, and retype the command.

Error On Line nnn No "SUB' File Present

Meaning. This message can be displayed if SUBMIT cannot find the specified .SUB file. That is, if:

- The file name is mistyped.
- The file type is other than .SUB.

Refer to Chapter 2 of this guide for more information about the SUBMIT command.

Action.

- Retype the command with the correct file name.
- Create a file with a .SUB file type, insert the desired commands, and retype the command.

FATAL ERROR
Hard disk does not respond

Meaning. This message can occur if the hard disk did not indicate that it had completed a procedure.

Action. Return to the Main Screen and try to run the diagnostic test (Option 4).

FATAL ERROR
Hardware failure detected during testing

Meaning. This message can occur during the initialization procedure of your hard disk when either the disk controller board or the drive has faulty hardware.

Refer to the *Rainbow Winchester Disk Option Installation Guide* for more information about installing the hard disk.

Action. Return to the Main Screen and run the diagnostic test (Option 4).

FATAL ERROR
Initialization data could not be read from hard disk

Meaning. This message can occur while using the hard disk if the utility program cannot read back some of the data that it previously wrote onto the hard disk.

Refer to Chapter 6 of this guide for more information about the hard disk utility program.

Action. Return to the Main Screen and try to run the diagnostic test (Option 4).

FATAL ERROR
Initialization data could not be written on hard disk

Meaning. This message can occur while using the hard disk if the utility program was not able to write some of the data that the operating system needs to read at a later time.

Refer to Chapter 6 of this guide for more information about the hard disk utility program.

Action. Return to the Main Screen and try to run the diagnostic test (Option 4).

FATAL ERROR
No hard disk diagnostic program

Meaning. This message can occur when the file DEX16UTL.CMD is not found on the utility diskette provided with the hard disk.

Refer to Chapter 6 of this guide for more information about the utility diskette.

Action. Make a new copy of the utility diskette from the master copy.

FATAL ERROR
No pre-boot program

Meaning. This message is rare, but can occur if the file containing the pre-boot program could not be found on the utility diskette.

Action. Using DISKCOPY, make a new copy of the diskette from the master utility diskette.

FATAL ERROR
No secondary boot program

Meaning. This message is rare, but can occur if the file containing the secondary boot program could not be found on the utility diskette.

Action. Using DISKCOPY, make a new copy of the master utility diskette.

FATAL ERROR
Programming error occurred

Meaning. This message is very rare but can occur if the hard disk utility program detects a problem with the program code.

Action. If this message is displayed, report the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Appendix C of this guide.

FATAL ERROR
Secondary boot program is too big

Meaning. This message is rare, but can occur if the secondary boot program does not fit into the allocated space on the hard disk. This can only occur if the file was somehow overwritten or changed.

Action. Using DISKCOPY, make a new copy of the diskette from the master utility diskette.

FILE EXISTS

Meaning. This message can be displayed if you try to create or rename a file with a name that already exists.

Refer to Chapter 2 of this guide for more information about file names.

Action. Use another file name.

File Not Found

Meaning. This message can be displayed by STAT if:

- The specified file is not found on the specified diskette.
- The file name or file type is mistyped.
- The period between the file name and the file type is omitted.
- The wrong drive is specified.
- The file type is omitted.
- Too few wildcards are used.

Refer to Chapter 2 of this guide for more information about the STAT command.

Action.

- Insert the diskette containing the file.
- Retype the command including the correct file name and file type.
- Retype the command including the period between the file name and file type.
- Specify the correct drive.
- Retype the command including the file type.
- Retype the command including enough wildcards.

Hard disk option is not connected

Meaning. This message can occur if the utility program did not find the hard disk controller board.

Refer to the *Rainbow Winchester Disk Option Installation Guide* for more information about the hard disk controller board.

Action. Recheck the connections of the controller board, and try the procedure again.

Invalid Assignment

Meaning. This message can be displayed if STAT finds an invalid physical-to-logical device assignment in the command. This message usually is displayed because:

- The physical or logical name is mistyped or is invalid.
- The equal sign is omitted from the command.

Refer to Chapter 2 of this guide for more information about the STAT command.

Action.

- Retype the command with valid physical and logical names.
- Retype the command including an equal sign.

The command STAT VAL: displays valid assignments.

Invalid Assignment
Use: STAT drv:=RO

Meaning. This message can be displayed by STAT if:

- An invalid attribute is assigned to a drive.

- The attribute is omitted from the command when assigning a drive an attribute.

Refer to Chapter 2 of this guide for more information about the STAT command.

Action.

- Retype the command including a valid drive attribute.
- Retype the command including an attribute.

Invalid Assignment
Use: STAT drv:filename.typ [size] [ro] [rw] [sys] or [dir]

Meaning. This message can be displayed if STAT finds an invalid attribute in the command. This message usually is displayed if:

- The colon is omitted from a physical or logical device name.
- The drive name is omitted.
- The attribute is mistyped.
- An invalid attribute separator is included.

Refer to Chapter 2 of this guide for more information about the STAT command.

Action.

- Retype the command including the colon as part of the physical or logical device name.
- Retype the command including a drive name.
- Retype the command including a valid attribute.
- Retype the command including a valid attribute separator.

MEMORY NOT AVAILABLE

Meaning. The operating system displays this message if:

- There is not enough memory to run the program or load the data you want to use.
- Memory is not cleared from the previous program.

Action.

- Check the size of the program to make sure it fits into memory by referring to the program's documentation.
- Type:

  Ctrl/C

  to clear memory.

Then, retry the procedure.

nn?

Meaning. This message can be displayed if you specify a user number less than 0 or greater than 15 in a USER command line.

Refer to Chapter 2 of this guide for more information about the USER command.

Action. Retype the command using a valid user number.

NO FILE

Meaning. This message can be displayed by DIR if:

- The file is not found on the specified diskette.
- The file name or file type is mistyped.

- The period between the file name and the file type is omitted.
- The wrong drive is specified.
- The file type is omitted.
- Too few wildcards are used.

Refer to Chapter 2 of this guide for more information about the DIR command.

Action.

- Retype the command after inserting the diskette containing the file.
- Retype the command including the correct file name and file type.
- Retype the command including the period between the file name and file type.
- Retype the command including the correct drive.
- Retype the command including the file type.
- Retype the command including enough wildcards.

NON-SYSTEM FILE(S) EXIST

Meaning. This message can be displayed if you type DIRS and files with the Directory Attribute exist on the diskette for the current user number.

Refer to Chapter 2 of this guide for more information about the DIRS command.

Action. No action is required; this is an informative message only indicating that the diskette contains files with the Directory Attribute.

READ ERROR

Meaning. This message can be displayed if TYPE cannot read the specified file.

Refer to Chapter 2 of this guide for more information about the TYPE command.

Action. Use STAT to check the status of the file; you may need to change the attribute. Then retype the command. Refer to Chapter 2 of this guide for more information about the TYPE and STAT commands.

Read error on drive drv:, track nn, sector nn
Type a number followed by Return:
1. Retry operation.
2. Cancel program execution.
3. Ignore error.
4. Proceed, returning error.
==>

Meaning. This message can be displayed if:

- The operating system cannot read a diskette.
- You have inserted a diskette with a format other than Rainbow.

Action. Select one of the options by typing a number and pressing the Return key.

1. If you choose to retry the procedure, the operating system repeats the failed disk operation. If the conditions causing the message have cleared up, the operating system continues as though no message had occurred. If the conditions causing the message still exist, the message will be repeated.
2. If you choose to cancel the program, the operating system stops the current command or program process and returns you to the system prompt. If the operating system was in the process of writing files on the diskette when the message occurred, the files may be incomplete.
3. If you choose to ignore the error, the operating system continues with the command or program as if no error had occurred. Any data read or written after this will probably be incorrect and you should check the files when done.

4. If you choose to proceed, returning the error, the operating system returns the error condition to the command or program. The program in turn discontinues processing and the result is identical to option 2. Some applications may provide additional actions or messages.

If you return to the operating system:

1. Replace the diskette.
2. Retry the operation.

READ ERROR. Try another? (Y/N)

Meaning. This message can be displayed if DISKCOPY cannot read the source diskette.

Refer to Chapter 2 of this guide for more information about the DISKCOPY command.

Action. Insert a new source diskette. Then press the Y key to retry the procedure.

If you want to exit the program, press the N key and then the Exit key.

READ ERROR - UNABLE TO READ ALL DISK SECTORS

Meaning. This message can occur while you are formatting the Winchester disk if the utility program was not able to read back one of the sectors just created. Refer to Chapter 6 of this guide for more information about formatting a hard disk.

Action. Try the FORMAT procedure again. If the message persists, the disk is probably faulty and should be replaced by:

- Reporting the problem to your vendor.
- Reporting the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Appendix C of this guide.

- Ordering the part and installing it yourself if you have the *Rainbow 100 User's Service Guide.* This guide is *not* included in the Rainbow System Kit.

RED ERROR: Bad syntax on line
Try RED NEWNAME [=] [OLDNAME] [/W]

Meaning. This message can be displayed while using RED if, for example, you include an extra character on the command line such as two equal signs. The second portion of the message is a reminder of the correct way to type the line.

Refer to Chapter 3 of this guide for more information about RED.

Action. Retype the line.

RED ERROR: Cannot edit read-only file

Meaning. This message can be displayed while using RED if the file you want to edit, or the diskette drive on which the file resides has been set to read only.

Refer to Chapter 3 of this guide for more information about RED.

Action. Reset the attribute of the file or diskette drive.

RED ERROR: Illegal character on line,
do not use , < > ; ? [ ] *

Meaning. This message can be displayed while using RED if you include any of the listed characters on the same line as the RED command.

Refer to Chapter 3 of this guide for more information about RED.

Action. Retype the line.

RED ERROR: Please enter "RED" followed by a file name

Meaning. This message can be displayed while using RED if you omitted a file name after the command, RED.

Refer to Chapter 3 of this guide for more information about RED.

Action. Retype the command including the file name.

Rename Error: File "filename.ext" already exists press any key to continue

Meaning. This message can be displayed if MAINT tries to rename a file to an existing file name.

Refer to Chapters 1 and 2 of this guide for more information about the MAINT command.

Action. Press any key to implement the other changes you marked on the MAINT directory. Then, rename the file with another name.

Seek error on drive drv:, track nn
Type a number followed by Return:
1. Retry operation.
2. Cancel program execution.
3. Ignore error.
4. Proceed, returning error.
==>

Meaning. This message can occur if:

- The operating system could not read the diskette.
- You have inserted a diskette with a format other than Rainbow.

Action. Select one of the options by typing a number and pressing the return key.

1. If you choose to retry the procedure, the operating system repeats the failed disk operation. If the conditions causing the message have cleared up, the operating system continues as though no message had occurred. If the conditions causing the message still exist, the message will be repeated.
2. If you choose to cancel the program, the operating system stops the current command or program process and returns you to the system prompt. If the operating system was in the process of writing files on the diskette when the message occurred, the files may be incomplete.
3. If you choose to ignore the error, the operating system continues with the command or program as if no error had occurred. Any data read or written after this will probably be incorrect and you should check the files when done.
4. If you choose to proceed, returning the error, the operating system returns the error condition to the command or program. The program in turn discontinues processing and the result is identical to option 2. Some applications may provide additional actions or messages.

If you return to the operating system, try to reformat the diskette using FORMAT. Beware of the fact that all current data on the diskette will be lost.

If the problem persists, refer to the *Rainbow 100 User's Service Guide* to ensure that the drive cables are installed properly. If the problem still persists:

- Report the problem to your vendor.
- Report the problem to the DIGITAL Customer Help Line. For the phone number of the office nearest you, look on the bottom of your keyboard or refer to Appendix C of this guide.
- Order the part and install it yourself if you have the *Rainbow 100 User's Service Guide.* This guide *is not* included in the Rainbow System Kit.

SORRY CANNOT OPEN DOCUMENT

Meaning. This message can be displayed if RED cannot write a file onto a diskette due to insufficient directory space. Diskette directories can hold 128 file names. RED usually displays this message if the diskette contains many small files.

Refer to Chapter 3 of this guide for more information about RED.

Action. Insert another diskette with free space on it or erase unneeded files from the diskette. Then, recreate the document.

SOURCE DISKETTE FORMAT IS INCORRECT

Meaning. This message can occur if the DISKCOPY program cannot determine the type of diskette in the source drive.

Refer to Chapter 2 of this guide for more information about the DISKCOPY command.

Action. Replace the diskette in the source drive.

SOURCE DISKETTE IS NOT RX50 FORMAT

Meaning. This message can occur when using DISKCOPY if you have a diskette with the wrong format in the source drive.

Refer to Chapter 2 of this guide for more information about the DISKCOPY command.

Action. Replace the diskette with one that has the proper format, or format the diskette currently in the drive.

SYSTEM FILE(S) EXIST

Meaning. This message can be displayed if you type DIR and files with the System Attribute exist on the diskette for the current user number.

Refer to Chapter 2 of this guide for more information about the DIR command.

Action. No action is required; this is an informative message only, indicating that the diskette contains files with the System Attribute.

The file CPM.SYS not found on this disk Do a system reset with a new disk

Meaning. This message can be displayed if the operating system cannot find the file CPM.SYS on the diskette. This file must be stored on the system diskette to start the operating system.

Action.

1. Reset the computer by pressing the Set-Up key and then typing Ctrl/Set-Up.
2. Insert a system diskette with the file CPM.SYS on it.
3. Restart the operating system.

The file Z80CNF.SYS cannot be loaded

Meaning. This message can be displayed if the operating system cannot load the file Z80CNF.SYS into memory; this file must be loaded to run CP/M-80 programs. The reason is possibly due to a bad copy of Z80CNF.SYS

Action.

- Type:

  Ctrl/C

  to reinitialize the operating system.
- Retry the procedure.
- Try a different diskette with Z80CNF.SYS on it.

The file Z80CNF.SYS cannot be found on the System Disk

Meaning. This message can be displayed if the operating system cannot find the file Z80CNF.SYS on the system diskette. This file must be stored on the system diskette to run CP/M-80 programs.

Action.

1. Insert a system diskette with the file Z80CNF.SYS stored on it.
2. Retry the procedure.

The start of partition drv: was moved

Meaning. This message can occur while using the utility to partition the hard disk if one or more bad sectors are found on the first two tracks of the partition. The start of the partition is moved to a location where two consecutive problem-free tracks are found.

Refer to Chapter 6 of this guide for more information about the partition utility for the hard disk.

Action. Press the Resume key. The partition is still usable, but is slightly smaller.

Topic not found

Meaning. This message can be displayed if HELP finds no information on the requested topic.

Refer to Chapter 2 of this guide for more information about the HELP command.

Action. Select a topic from the Help Menu.

WARNING: Files may not be intact on drive drv:

Meaning. This message can occur when you turn on the computer, or start the operating system, if you have a hard disk. It indicates that there may be a problem with the files on the disk.

Action. Make a back-up copy of the files on the disk. Then re-run the utility program to initialize the hard disk, or reformat the partitions on the disk. Refer to Chapter 6 of this guide for more information about backing up files and reformatting partitions. Refer to the *Rainbow Winchester Disk Option Installation Guide* for more information about installing the disk.

WARNING: The hard disk is not formatted or not partitioned

Meaning. This message occurs if:

- The hard disk has not been installed properly.
- The hard disk has been installed properly, and the diagnostic test has been run successfully, but something has happened to the disk.

The situation is not fatal, but the files on your hard disk may contain lost or garbled data.

Action. Rerun the diagnostic test and the initialization procedure.

If the problem persists:

- Call your vendor
- Call the DIGITAL Customer Help Line

Refer to Chapter 6 of this guide for more information about running the diagnostic test.

WRITE ERROR: CANNOT FORMAT DISKETTE

Meaning. This message indicates that the diskette is write-protected.

Action. Remove the write-protect tab and restart the procedure.

Write error on drive drv:, track nn, sector nn
Type a number followed by Return:
1. Retry operation.
2. Cancel program execution.
3. Ignore error.
4. Proceed, returning error.
==>

Meaning. This message can be displayed if the operating system cannot write onto a diskette.

Action.

1. If you choose to retry the procedure, the operating system repeats the failed disk operation. If the conditions causing the message have cleared up, the operating system continues as though no message had occurred. If the conditions causing the message still exist, the message will be repeated.
2. If you choose to cancel the program, the operating system stops the current command or program process and returns you to the system prompt. If the operating system was in the process of writing files on the diskette when the message occurred, the files may be incomplete.
3. If you choose to ignore the error, the operating system continues with the command or program as if no error had occurred. Any data read or written after this will probably be incorrect and you should check the files when done.
4. If you choose to proceed, returning the error, the operating system returns the error condition to the command or program. The program in turn discontinues processing and the result is identical to option 2. Some applications may provide additional actions or messages.

WRITE ERROR. Try another? (Y/N)

Meaning. This message can be displayed if DISKCOPY cannot write onto the destination diskette.

Refer to Chapter 2 of this guide for more information about the DISKCOPY command.

Action. Insert a new destination diskette. Then, press the Y key to retry the procedure.

If you want to exit the program, press the N key and then the Exit key.

C
Getting Help

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Norway	(02)-25 64 22
France	(1)-687 31 52
Austria	(222)-67 76 41 extension 444
Australia Sydney	(02) 412-5555
All other areas	(008) 226377

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